A PORTFOLIO OF TWO ESSAYS

A Dissertation
Presented to the Faculty of the Graduate School
Cornell University
in Partial Fulfillment of the Requirements for the Degree of
Doctor of Musical Arts

by
Tonia Chi Wing Ko
May 2017

A PORTFOLIO OF TWO ESSAYS

Tonia Chi Wing Ko, D.M.A.
Cornell University 2017

This portfolio attempts to reach into overlooked corners of organology, examining the celesta's aesthetic history and the more experimental practice of playing balloons. Both instruments have unusual sound qualities, which have relegated their typical musical usage to effects or gimmicks. Thus, even though they are both ubiquitous in some way— within orchestral repertoire and in daily life, respectively—the celesta and the balloon have not received significant scholarly attention thus far.

"Between Worlds" explores the celesta's historical origins, physical mechanism, and musical idioms. Behind its beloved, sparkling sound, the instrument contains many complexities. Mechanically, it combines features of keyboard and percussion, occupying a no-man's land in terms of classification and performance technique. The sonic identity and poetic implications of the celesta are inspired by a nineteenth century marvel, the music box. As a result, its sound has taken on cultural associations, becoming a signifier for the magical, supernatural, and uncanny. Discussion of several works spanning from the eighteenth to twenty-first century demonstrate the varied ways in which composers interact with the instrument's rich tradition.

"Acts of Envelopment" is a discussion of Judy Dunaway's work for latex balloons as a comprehensively tactile approach to music-making. She has transformed the balloon into flexible and sonically diverse instrument, developing a range of performance techniques as well as specialized notation methods. Her pieces— whether they are solo improvisations, Fluxus-style events, or sound installations— are informed by the physical properties of sound and the resulting bodily sensations that it creates. For Dunaway, each performance is an act of

envelopment, both physically and metaphorically. Turning away from the object's traditional associations with parties and humor, Dunaway's balloon practice is also a powerful political statement that expresses her feminist views. Her singular focus on this instrument is a unique contribution to American experimentalism.

BIOGRAPHICAL SKETCH

The music of Tonia Ko (b.1988) has been lauded by *The New York Times* for its "captivating" details and "vivid orchestral palette." Her interests in texture and physical movement play into a larger theme of interdependency between visual art and music. Tonia's music has been performed by ensembles such as Minnesota Orchestra, Volti, New York Youth Symphony, Flux Quartet, orkest de ereprijs, Eastman Wind Ensemble, and New Morse Code. She has been featured at nief-norf Summer Festival, Aspen Music Festival, Tanglewood Music Center, Shanghai New Music Week, and Santa Fe Chamber Music Festival. Tonia has received awards from the American Academy of Arts and Letters, BMI, Composers Now, as well as residencies at Copland House, Djerassi, and Atlantic Center for the Arts. She is represented by Young Concert Artists as 2015-2017 Composer-in-Residence. Her explorations as an artist have sparked interdisciplinary connections— most prominently *Breath, Contained*, an ongoing project using bubble wrap as a canvas for both art and sound. Born in Hong Kong and raised in Honolulu, she earned previous degrees from Indiana University and the Eastman School of Music.

ACKNOWEDGEMENTS

I would like to thank my special committee David Yearsley, Xak Bjerken and Kevin Ernste (chair) for invaluable input and guidance on these articles as well as their support during my time at Cornell University. My gratitude also goes to Judy Dunaway for her correspondence over the last year and for providing me with generous information about her work. Additionally, I want to acknowledge Roger Moseley for his insights on the celesta essay in its first version during the keyboard studies seminar. Graduate Field Coordinator Colette Larkin provided me with indispensable help with advising and administrative tasks this year. Finally, I would like to express my gratitude to Michael Compitello proofreading these essays and for his unwavering patience and encouragement.

TABLE OF CONTENTS

BETWEEN WORLDS:
A HISTORY OF THE CELESTA AS A DISEMBODIED EXPERIENCE

When we hear the sound of a celesta, we immediately know that something exceptional is happening in the music. The instrument's distinctive quality signals to listeners that what we are hearing is no longer the "norm," and this reaction comes from a largely conditioned response created by its traditional function within the standard repertoire. Yet the assignment of such "special-ness" to the celesta's musical role is only one aspect of the instrument's fascinating complexities. This essay traces the history of the celesta and the evolution of particular aesthetics surrounding the instrument. Its physical mechanism lies directly between a keyboard and percussion instrument, resulting in problems of classification, manufacturing, and performance technique. In terms of musical idiom, this instrument has transformed itself from its naive, music-box origins to inhabit the uncanny world of the Sugar Plum Fairy and automatons, to now challenging those very stereotypes in contemporary music. The unique space that it occupies, both historically and within our current discourse, presents challenges for the performer and audiences alike.

I. Invention and Classification

The celesta was patented in 1886 by Charles Victor Mustel,[1] an organ and harmonium builder in Paris, and exhibited at the 1889 world exposition. There, the instrument (Figure 1) achieved immediate success and was awarded the "*Grand Prix Exposition Universelle de Paris – 1889*"; Mustel himself received the order of "*Chevalier de la Légion d'honneur*." Although Mustel's invention stood the test of time, it grew out of various failed experiments in keyboard percussion between the late eighteenth and nineteenth centuries. These predecessors include Englishman

1. Schiedmayer Celesta Company, "Celesta Builder," 2011, accessed April 2014, http://www.celestaschiedmayer.info/index.php?option=com_content&view=article&id=50&Itemid=57&lang=en

Figure 1

Charles Claggett's aiuton dating from 1788 and the four-octave adiophone of Fischer & Fritz, patented in Leipzig in 1882.[2] The most direct prototype of the celesta was the typhone or dulcitone, which was built twenty years before by Mustel himself. This instrument was also keyboard-operated but used a series of tuning forks instead of steel bars, resulting in a similarly bell-like, but less powerful sound.[3] In addition to sharing the company of these obsolete instruments of the late nineteenth century, the introduction of the celesta also coincided with important developments in the percussion field. The first appearance of the xylophone in Western classical music came in the form of the tryphone, built by Parisian Charles de Try during the 1860s.[4] It was quickly popularized by works such as Camille Saint-Saen's *Danse Macabre* (1874), with a virtuosic passage that depicts clattering skeletons. Both the celesta and xylophone have

2. Claggett's instrument was made "without Pipes, Glasses, Bells, or Strings, produces Tones sweeter than on any other Organ yet invented." It had a range of three to six octaves and used tuning forks or metal prongs or rods fixed onto a board. The metal was to vibrate with fingered keys moving hammers or jacks with levers. As cited in *Musical Phenomena*, No. I, 1793, (London: Eyre & Spottiswoode, 1856), 8.
3. James Blades, *Percussion Instruments and their History*, (New York: Frederick A. Praeger, 1970), 311.
4. Ibid., 309. Perhaps this new interest in percussion instruments exerted an influence on the piano, which has increasingly become aware of its percussive qualities during the twentieth century.

distinctive timbres and a particularly high range.[5] This general interest in unusual, high-pitched sounds will be explored later as a cultural phenomenon of its time.

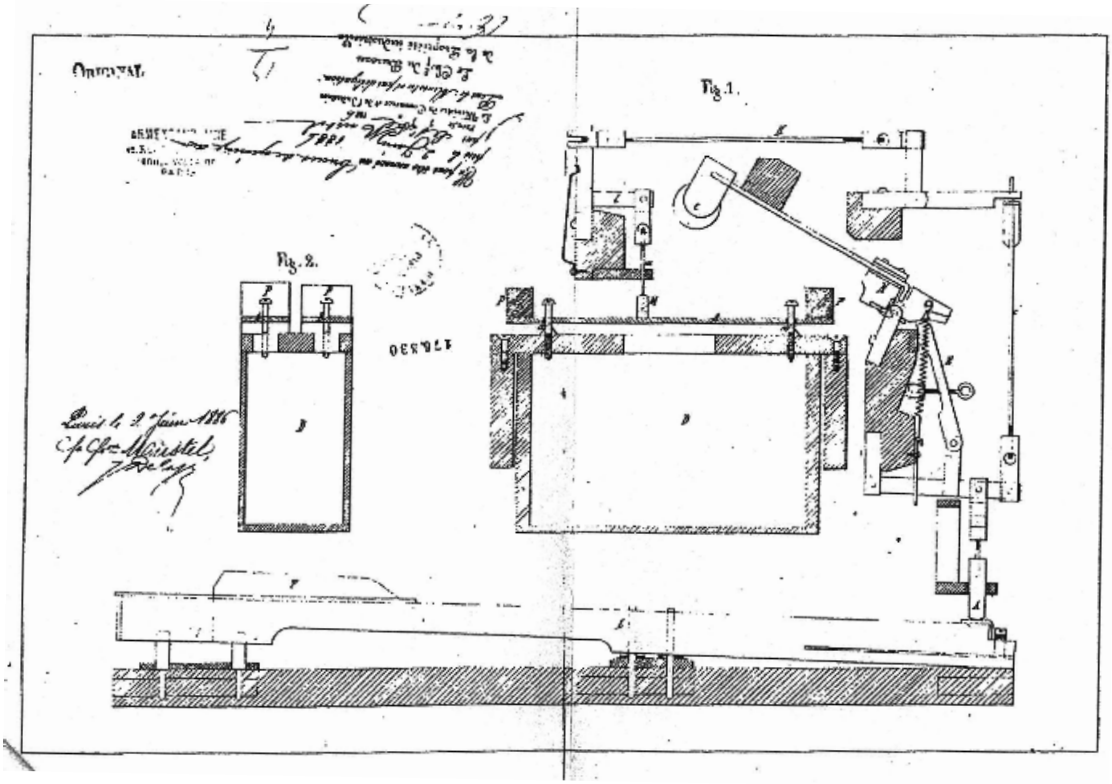
With a keyboard exterior and percussive interior, the celesta is inherently a combination of the two instrumental categories. The percussion mechanism within the celesta consists of a series of steel bars that are struck with keyboard-activated felt hammers. In the original 1886 patent, Mustel's description of his new invention specifies that steel bars are placed over hollow wooden resonators and stuck from above with hammers. Furthermore, Mustel writes, "The metal bars, which have some analogy to children's toys that one calls metalophone, harmonica, timpanon, etc., differ from those employed by these little instruments by the weights (P), welded to the two extremities of said bars and are for an acoustical effect, not only to augment its sonic powers, but also to give more purity to the sound, by dampening the foreign vibrations [inharmonic partials] of the fundamental."[6] By adding resonators, weights, and dampers for each key, Mustel conceived of multiple ways to enhance and stabilize the sound of the celesta, giving it its characteristically mellow and resonant quality (Figure 2).

Orchestration and instrumentation books reveal a fascinating confusion over how the celesta should be classified. In the earliest sources that are still widely referred to today (dating from the early twentieth century), the celesta is grouped with percussion instruments despite its keyboard interface. In the 1904 edition of the Berlioz instrumentation treatise, prepared by Richard Strauss, the celesta appears as a bracketed addendum to the glockenspiel entry: "The *Celesta*… is an important addition to the orchestra. It may be considered an improved Glockenspiel, provided with a keyboard; its tone, produced by steel plates, is similar both to the

5. The celesta sounds an octave higher than written. On a five-octave instrument, its highest sounding note is C8, equivalent to the highest note on the piano.

6. "Les lames vibrantes qui ont quelque analogie avec ce jouet d'enfant, auquel on a donné le nom de métalophone, harmonica Timpanon, etc., diffèrent de celles employées dans ces petits instruments, par des pois ou une charge P, soudée aux deux extrémités des dites lames et, qui a pour effect acoustique, non seulement d'augmenter la puissance sonore, mais encoure de donner plus de pureté au son, en détruisant les vibrations étrangères au son fondamental." Charles Victor Mustel, "Celesta," Patent of the French Republic, Ministers of Commerce and Industry, 176530, filed July 2, 1886, and issued July 8, 1886. Translated by myself. Patent available from Schiedmayer Company at http://www.celesta-schiedmayer.de.

Figure 2



Glockenspiel and to the harp… Its beautiful sound is frequently d by the modern French and Russian composers."[7] In Cecil Forsyth's orchestration book from 1914, the celesta is again grouped with mallet percussion, and described thus: "The peculiar beauty of the tone is partly due to the fact that under each vibrating steel bar is an accurately-tuned resonator of wood. Attached to the instrument is a pedal which materially enhances its sustaining power. The Celesta never goes out of tune."[8] Although it is not clear which musicians played the celesta in its early days, it can be assumed that a keyboard player's finger dexterity would be more suited to the instrument than a percussionist who is accustomed to holding mallets.

In Murray Campbell's anthology of western instruments from 2004, the celesta appears again as percussion, but under the heading "instruments with vibrating bars," revealing a concern

7. Hector Berlioz, rev. Richard Strauss, trans. Theodore Front, *Treatise On Instrumentation*, (New York: Edwin F. Kalmus, 1948), 391. Interestingly, the xylophone also appears as a bracketed addition to the original edition.
8. Cecil Forsyth, *Orchestration*, (London: Macmillan and Co., 1914), 64.

with what is producing the sound rather than the manner of performance.[9] These vibrating bars — the celesta's percussive interior— differentiates it from the piano and its predecessors, which produce sound from the vibration of its strings, activated by either plucking or hitting them. Pianists over the decades have labored to imitate the human voice by way of the instrument's analogy to our vocal cords. The organ, to take another keyboard example, is also capable of the same comparison to the voice through its use of air.[10] Due its insides of hammers and metal plates, the celesta contains no analogy to human vocalization, and the music written for it tends not to imitate how we express and communicate through our bodies. Rather than the corporeal nature of its keyboard relatives, the celesta's musical idioms are inspired by the intricate and mysterious qualities of actual musical machines.

II. A Fanciful Machine: Early Idioms

The origins of the celesta can be traced a century prior to Mustel's patent in 1886. By the time the first small-scale musical machines were built by Swiss watchmakers around 1770, mechanical music already a familiar idea— the automatic carillon had existed in village towers for many centuries. However, the technology, and more importantly the aesthetic implications of these small machines— soon to be developed into music boxes— influenced the quality of sound as well as the traditional musical idioms of the celesta. The first "musical box" was exhibited by Antoine Favre at the *Sociéte des Arts* in Geneva in 1796, touted as "*carillons sans timbre ni marteau*."[11] These early "watch-carillons" consisted of "a tuned steel comb played by pins set in a cylinder or disc,"[12] a simple technology that remained more or less consistent even with later elaborations such as the barrel organ. And despite these obvious differences with the celesta's

9. Murray Campbell, Clive Greated, and Arnold Myers, *Musical Instruments: History Technology and Performance of Instruments of Western Music,* (New York: Oxford University Press, 2004), 218.

10. The organ's association with the church naturally lends itself to incorporeal connotations. In popular culture, for example, J.S. Bach's Toccata and Fugue in D Minor BWV 565 has become the default soundtrack to Halloween.

11. R. De Waard, *From Music Boxes to Street Organs*, trans. Wade Jenkins, (Vestal: The Vestal Press, 1967), 12.

12. John E. T. Clark, *Musical Boxes: A History and an Appreciation*, (London: The Fountain Press, 1952), 22.

basic mechanics, by 1830 the music box had also developed to see the addition of dampers and resonators. Clark's discussion of the music-box resonator echoes Mustel's original discussion of the same device in the celesta: "Hitherto the small combs had always sounded tinny or metallic. The resonators— small lead weights— were fixed on the underside of the bass notes of the comb…The use of the resonators not only improved the volume of sound but almost eliminated the metallic ring that many of the small combs gave out."[13] Despite being closely associated with the celesta, the glockenspiel never saw these enhancements of dampers and resonators, and is actually sought out for its metallic, free-ringing qualities.

Of all the musical machines of the nineteenth century, the music box was the most ubiquitous:

> In its day and generation it was the most popular, perhaps because of the ease with which it would be manipulated, or because of its portability and comparative low price. Whatever the reason, the musical box was in great favour in England over a period of about 100 years, from 1810-1910…they were manufactured in tens of thousands, and thus were to be found in nearly every home of rich and poor people alike.[14]

Because music boxes were marketed as jewelry boxes and snuffboxes, they made their way into the private homes of upper and middle class families, particularly between 1780-1850. These luxurious musical cases were completely handmade, made of silver or gold gilt, amber tortoiseshell, or hard wood, and even inlaid with jewels. Around 1835, the technology began to democratize among consumers in socio-economic class as well as age. Increasingly, the music box became an object of play for children: "…the small and cheap toy musical box was made. This was known as the Manivelles…and was turned by hand, the little movements having neither spring nor escapement. These were looked upon as novelties and in a few years were to be found in nurseries all over the world…"[15] In all its available forms, the music box was an important fixture in domestic musical life. The contrivance's distinctive sound quality penetrated the ears of the

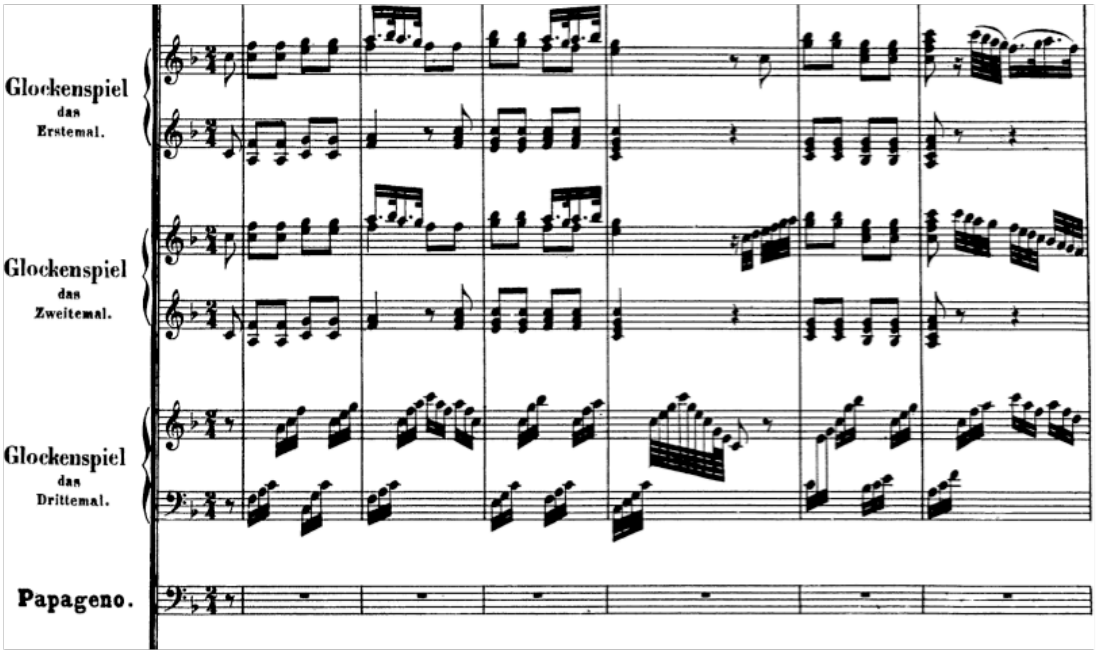
13. Ibid., 37.
14. Ibid., 12.
15. Ibid., 39.

concert-going masses for generations. Thus, the music box came to be associated with the domestic, particularly with childhood and femininity. DeWaard describes a stereotypical domestic scene: "Imagine, for a moment, the music box hidden in the jewel box of a delicate, aristocratic lady in her intimate boudoir. How subtly does the ethereal tune caress her soul!"[16] Since the celesta was invented during the height of the music box's popularity in Europe, it was likely developed with this particular sound in mind. The celesta's delicate and vulnerable qualities are described with great similarity to those of the music box, and continue to be expounded even in orchestration texts from the twentieth century. Forsyth writes, "Its tone-quality is sweet and clear, with a fairy-like transparence that is delicious. The light, fanciful, and the graceful are best suited to the character of the instrument."[17] Kent Kennan's entry on the celesta further relates that, "Gordon Jacob remarks picturesquely that the tone of the celesta always reminds him of the taste of a ripe plum. In spite of its charm, however, it has little power and is drowned out by anything but the lightest of backgrounds."[18] The images evoked by this type of sound are an inherent part of the instrument from the moment of creation; after all, the name of the instrument comes from the French word *céleste*, meaning "heavenly."

It comes as no surprise that one of the earliest examples of this music box-sound in classical music manifests itself in a character who is both fanciful and naïve: Papageno in Mozart's *Die Zauberflöte*. Writing this opera in 1791, Mozart must have been aware of the new technologies in small musical machines[19] as well as their poetic implications. The well-known parts for keyed glockenspiel in the aria "Ein Mädchen oder Weibchen" (Figure 3)[20] depict Papageno's enchanted bells, ringing repeatedly as he appeals for "a little girl or wife," who he

16. De Waard, *Music Boxes to Street Organs,* 6.
17. Forsyth, *Orchestration,* 69.
18. Kent Kennan and Donald Grantham, *The Technique of Orchestration, 4th edition*, (Englewood Cliff: Prentice Hall, 1990), 274.
19. Mozart wrote several pieces for the musical-clock— a novelty clock with a built-in organ. Annette Richards analyzes Mozart's Fantasie in F minor, K. 608 and the late-18th century vogue for mechanical instruments in "Automatic Genius: Mozart and the Mechanical Sublime," Music & Letters 80, no. 3 (1999): 366-89.
20. Wolfgang Amadeus Mozart, "Ein Mädchen oder Weibchen," *Die Zauberflöte* K. 620, score excerpt from IMSLP.

Figure 3



compares to "little doves."[21] Here, the music box sound is equated with something both domestic and diminutive. This part is frequently performed on celesta in modern productions. In fact, in the 2001 production of Opéra National de Paris, baritone Detlef Roth performs the aria with a small toy musical box in hand, cranking the handle of the prop whenever the "bell-music" occurs.[22] In this setting, the sparkling effect evokes an atmosphere of innocence, where any fantastical and supernatural occurrence can be explained as through a child's overactive imagination. During Mozart's time in the Enlightenment era, these musical machines elicited gleeful and "unclouded" emotions, "when genius in invention and the production of astonishing toys suddenly collided with mechanist thinking on the nature of body and soul."[23]

---

21. "Ein Mädchen oder Weibchen - Papageno's aria from Die Zauberflöte," trans. Lea F. Frey, http://www.aria-database.com/translations/mflute20_madchen.txt
22. "Detlef Roth performs "Ein Mädchen oder Weibchen" YouTube video, 6:04, from a performance by Opéra National de Paris in 2001, posted by "FoxyGrandpa," May 20, 2007, http://www.youtube.com/watch?v=ExnOKlnlodY. Interestingly, the orchestra actually uses a keyed glockenspiel here; compare the sound with the celesta used in Wolfgang Brendel's performance in August Everding's 1983 Munich production. YouTube video, accessed April 2014, http://www.youtube.com/watch?v=EQbtqx-m_0k.
23. Carolyn Abbate, "Outside Ravel's Tomb," *Journal of the American Musicological Society*, Vol. 52, No. 3 (Autumn, 1999), 476.

III. The Nineteenth Century: Descent into the Unseen and Uncanny

Within a few decades, the music box technology that had started as practical clock-work apparatus had evolved to embrace a musical interest. However, it continued to maintain commercial appeal also because of its mechanism— in other words, what makes the music box a machine. As with other automatic instruments, this attraction contains a sense of mystery because no human is directly creating the music. This quality of the unknown is heightened by the way that the machinery of these objects were often hidden from sight. The simplest models of music boxes consist of a case that opens to reveal the mechanism— pins, combs, cylinder, and all (Figure 4).[24] However, in the most elaborate snuffboxes, the user could no longer access these components (Figure 5). "The musical movement was protected by a cover of semi-opaque horn through which the movement could be faintly seen. This cover could not be opened; it was sealed."[25] Similarly, the celesta lacks the easily opened lid of a grand piano and confines its

Figure 4

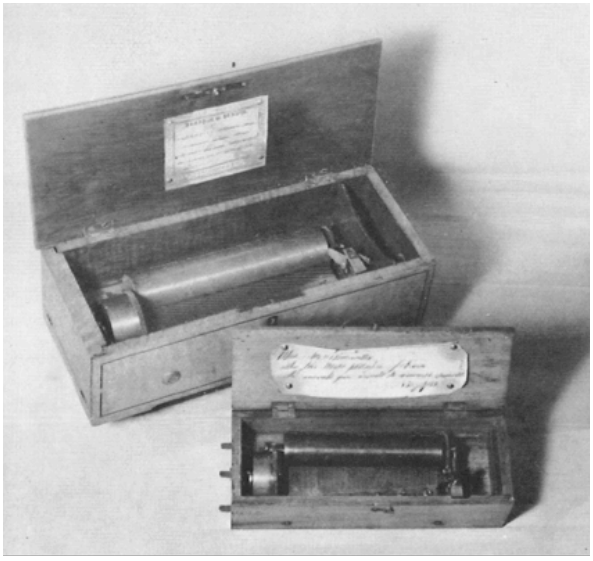
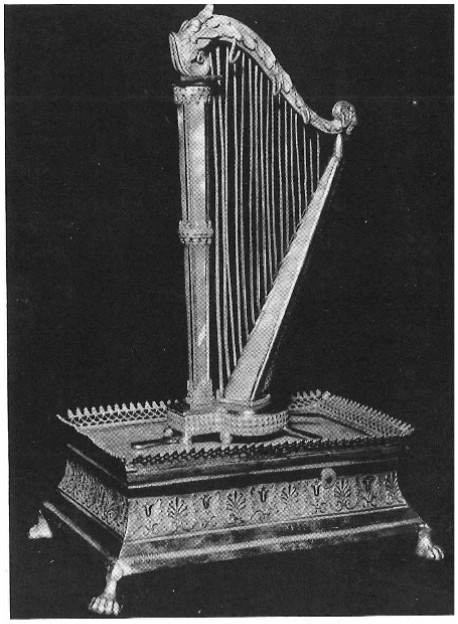


Figure 5



24. John E. T. Clark, *Musical Boxes: A History and an Appreciation*, (London: The Fountain Press, 1952), 26-8.
25. Clark, *Musical Boxes,* 20.

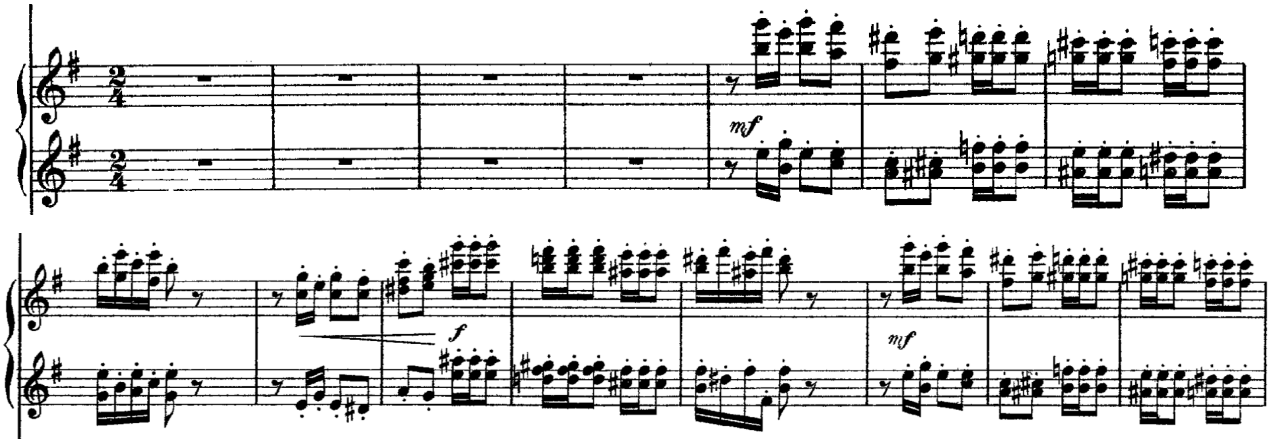
mechanism within a permanent wooden case. In some models, the side paneling consists of screens that make the mechanism visible, but only just barely. For this reason, even performers who play the celesta regularly do not know exactly how the interior action works and simply assume it to be like a piano's mechanism. While they might be very familiar with the instrument's sounds, musicians are often unaware of its physical aspects of sound production.

This concept of the unseen is a first step towards a sense of the uncanny. When something familiar is rendered inexplicable, supernatural, and/or strange, it becomes uncanny. While this sensation exists in human nature without regard to historical time, the uncanny as a culturally-identified psychological concept emerged in the early nineteenth century. The new technologies brought on by the Scientific Revolution no doubt incited these feelings on a widespread level. For instance, the phenomenon of automation— such as in a music box— lent an illusion of agency to inanimate objects as never before. Sigmund Freud's 1919 essay not only explored how the uncanny is perceived and culturally manifested, but also reaches insights through etymology of the world itself. In his analysis of the word *heimlich* (as opposed to *unheimlich*, translated as "uncanny"), he uncovers a double meaning of "homely" and "hidden," writing, "on the one hand, it means that which is familiar and congenial, and on the other, that which is concealed and kept out of sight."[26] Thus, in addition to its sound quality, the celesta's hidden mechanism contributes to its mysterious and magical connotations.

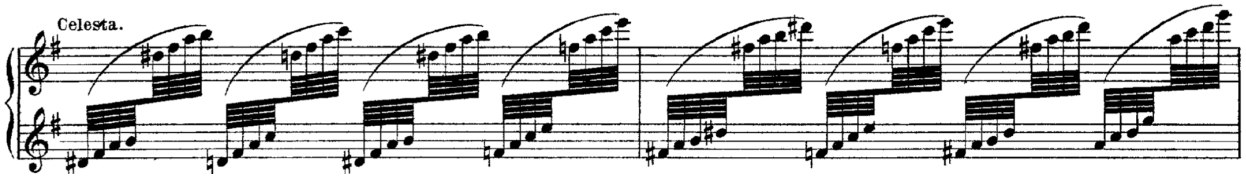
The transformation from the visible and innocent to the hidden and mysterious is not only mechanical, but musical as well. Although Mozart's Papageno and the antics of his fellow characters are otherworldly, audiences are kept at a distance from the supernatural and accept these events in the context of a completely make-believe world. In 1896, when the most famous

26. Sigmund Freud, "The Uncanny," trans. Alix Strachey, *Imago*, Bd. V., 1919, reprinted in Sammlung, Fünfte Folge, 4.

Figure 6



Later, a "dream-like" texture:



celesta excerpt appears in Tchaikovsky's "Dance of the Sugar-Plum Fairy" in *The Nutcracker,*[27] the sonic space is still an innocent setting, reminding audiences of the childhood pleasure in playing with a music box. However, the celesta entrance also contains slightly more eerie implications. Taking into consideration the obvious difference of compositional style between Mozart and Tchaikovsky, some surface details of the music are still significant in terms of idiom and meaning. The celesta music accompanying the Sugar Plum Fairy is set in a minor, rather than major mode, and is more harmonically complex than Papageno's bells, which are purely diatonic (Figure 6).[28] These complexities also relate to the narrative. Although the Sugar-Plum Fairy is a benevolent character, she lives in an environment where previously inanimate toys come to life. Moreover, she comes alive within a setting that was initially realistic (*The Nutcracker* opens with a familiar

27. Schiedmayer Celesta, "Celesta Builder," http://www.celesta-schiedmayer.info/, accessed April 2014. Tchaikovsky was one of the first composers to feature the celesta prominently in a composition, discovering the instrument after visiting the Mustel workshop in 1891. The popularity of his ballet in the decades after its premiere no doubt contributed to the celesta's lasting role as an orchestral instrument.
28. Peter Iljitsch Tschaikowsky, "Casse-Noisette," *Suite from the ballet The Nutcracker: for orchestra*, (Wiesbaden: Breitkopf & Härtel, 1993).

family Christmas party, whereas a dragon appears in the very first scene of *The Magic Flute*). Tchaikovsky's celesta music therefore occurs in a transitional setting, "less imaginary than the world of fairy tales… yet differ[s] from the real world by admitting superior spiritual entities such as daemonic influences or departed spirits."[29] When the musical function of the celesta was established in the late nineteenth century, the instrument broadened the meanings of an already familiar sound— that of the miniature musical machine. At the turn of the century, the immense technological advances of such machines began to threaten our psyche— "the astonishing toys had become frightful."[30] The celesta's idiom, which began at the innocent musings of a child's imagination, expands to include the realistic world, but specifically one where fantastical and paranormal events occur.

The space that lies between imagination and reality can further include the fearsome and macabre. The celesta, an "instrumentalized" version of the music box, depicts a source of fear originating from within the familiar and homely (the *heimlich*) rather than from external forces. According to Freud, the "uncanny is in reality nothing new or foreign, but something familiar and old— established in the mind that has been estranged only by the process of repression." Due to this act of repression, the uncanny is "something which ought to have been kept concealed but which has nevertheless come to light."[31] Thus, the integration of musical machines into domestic life had a profound impact on the development of the uncanny aesthetic in music. Simultaneously, the music box's close association with celesta established its most historically persistent function of representing the alien and "otherworldly."

The development of musical machines extends to include automatons, intricate mechanical contraptions built to imitate humans and to perform certain tasks. When music boxes were first created in late eighteenth century Switzerland, automatons had already existed

29. Freud, "The Uncanny," 18.
30. Abbate, 476.
31. Ibid., 13.

for many centuries, as personal projects of eccentric engineers and sophisticated novelty items for aristocrats and royalty.[32] Automatons elaborated simple musical machinery into life-like guises, and for the most part, audiences of the time saw them as delightful technological marvels. While some were simply additions to the snuffbox in the form of a singing bird,[33] others were life-sized, anthropomorphized machines made to imitate humans and their interaction with music. In 1770, Henri Louis Jacquet-Droz built an automaton known as "The Musician" (Figure 7).[34] Still functional today,[35] it replicates in detail the bodily movements of a human musician, but also the physical action of performing on a small organ:

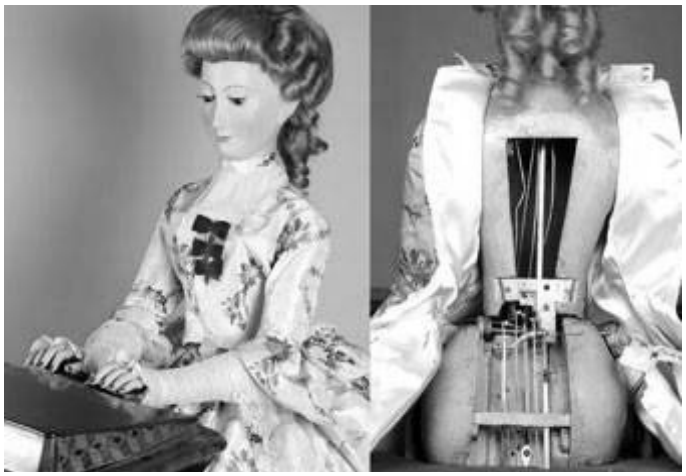
> The performer is a well-modelled figure of young girl with long slender fingers seated with hands out-stretched. When the mechanism is started the figure leans forward to be nearer to the keyboard, the bosom heaves as if in a state of emotion. The fingers run over the keyboard and actually touch the keys of the organ, and their action plays an old French melody. At the end of the tune the young lady makes a graceful bow, both to the left and to the right.[36]

This particular automaton is reminiscent of De Waard's vision of the lady sitting in an "intimate boudoir" enjoying her music box. To a modern observer, however, this "musician" might be unsettling for several reasons. First of all, the automaton engages in movements of the living without having real, sentient thoughts. The machinery that makes it seem alive is invisible, hidden inside her "body." Furthermore, the automaton, as a type of doll, distorts the childhood fantasy of wanting toys to come to life. As Freud mentions, "We remember that in their early games children do not distinguish at all sharply between living and lifeless objects, and that they

---

32. Examples of early automatons include those documented by Ibn al-Razzaz al-Jazari in 1206. *The Book of Knowledge of Ingenious Mechanical Devices*, trans. Donald R. Hill (Boston: D. Reidel, 1974).
33. Although they began as a small novelty items, subsequent development of these singing birds rendered them quite realistic and therefore, rather uncanny: "At a later period, when life-size birds were produced in cages, they looked and sounded so lifelike that it was at times difficult to realize that the whole thing was entirely and absolutely mechanical." Clark, *Musical Boxes,* 169.
34. "The Musician" (1770), automaton by Jaquet-Droz, from the website of Museum of Art and History in Neuchâtel, France, accessed April 2014, http://www.mahn.ch/collections-arts-appliques-automates
35. Along with two other Jacquet-Droz automatons, "The Musician" currently resides in the Musée d'Art et d'Histoire of Neuchâtel, in Switzerland. http://www.mahn.ch/collections-arts-appliques-automates.
36. Clark, *Musical Boxes,* 179.

Figure 7



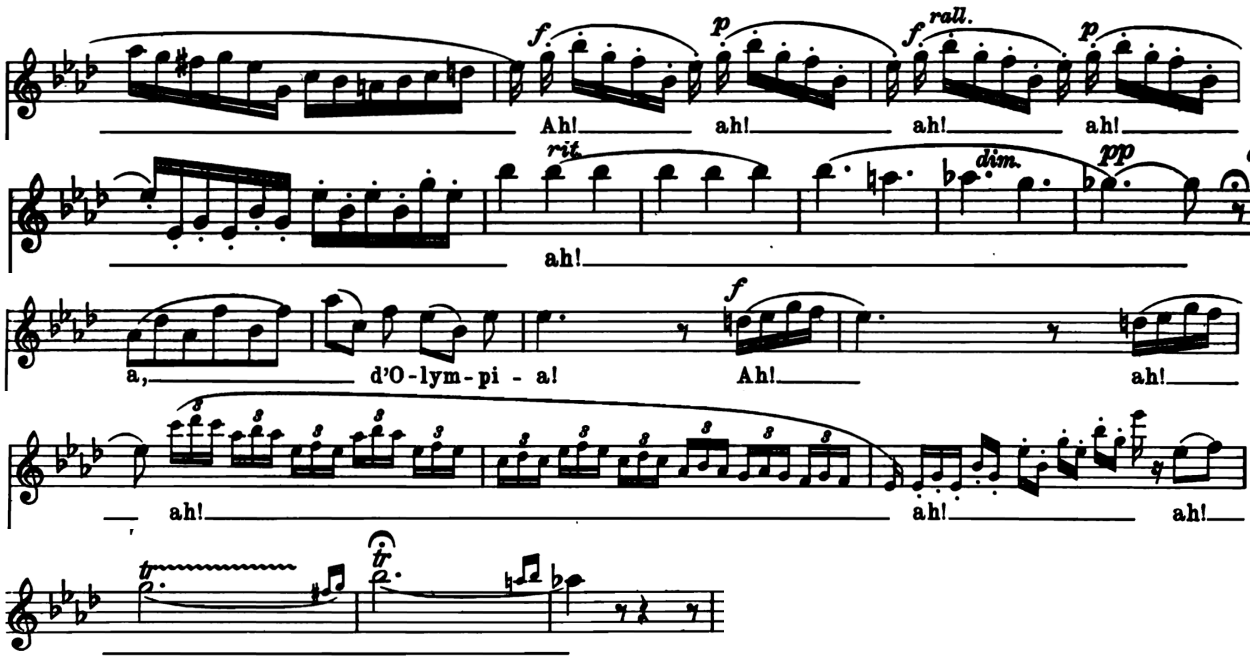
are especially fond of treating their dolls like live people."[37] While this supernatural animation occurs in the Sugar-Plum Fairy, the entire premise of the ballet is that toys come alive through the eyes of a child. When we see this phenomenon as manifested in automatons as adults, it becomes uncanny. As we grow older, we begin to repress what Freud calls "infantile" desires, such as wanting dolls to come alive. When we encounter such ideas in our adult lives, our instinctive repression of them causes cognitive dissonance, which leads to feelings of discomfort and trepidation.

The uncanny is exemplified in the literary works of E.T.A. Hoffmann as part of a larger cultural phenomenon of the nineteenth century. In his writings, inanimate objects frequently come to life.[38] The character of Olympia from Hoffman's short story "Der Sandmann" (1816) is in fact an automaton— an anthropomorphized form of the musical and mechanical uncanny combined. Her appearance in the story, and subsequently in Offenbach's opera *Les contes d'Hoffmann* (1881) is much more bizarre than Tchaikovsky's Sugar Plum Fairy. Although both are female figures renown for their physical beauty, Olympia exists in a setting where the other characters recognize her artificiality. David Ellison summarizes her strange demeanor and its

37. Freud, "The Uncanny," 9.

38. Interestingly, although Hoffmann is also the author of the original "Nutcracker" story (1816), Tchaikovsky's ballet adaption removes its most macabre elements.

Figure 8



relationship to the clockwork origins of a musical machine: "…her dead gaze, her stiff bearing, her 'conversation' composed only of exclamatory monosyllables— may reveal mechanism in the technological sense, a clockwork precision proceeding from her very inhumanity."[39] As the object of Nathaniel (in the original) and Hoffmann's (in the opera) fervent romantic love, Olympia was definitely not conjured from a child's naive imagination. Her presence in a sexualized, adult world makes the situation all the more strange.

In Hoffmann's original story, Olympia's voice is described in a way that seems to predict the sound of the celesta. She sings "… with a voice like the sound of a glass bell, clear and almost piercing, " and ends her concert with "the long trill [that] sounded shrilly through the room."[40] In Offenbach's opera, Olympia's aria "Les Oiseaux dan la Chamille" (commonly known as "The Doll Song") fittingly requires a coloratura soprano with virtuosity and brilliance in the highest

39. David R. Ellison, *Ethics and Aesthetics in European Modernist Literature: from the Sublime to the Uncanny,* (New York: Cambridge University Press, 2001), 59.

40. E.T.A. Hoffmann, "Der Sandmann," trans. John Oxenford, 1816, 11.

register.[41] Olympia's sings in the third person, clearly "programmed" by her maker to introduce her voice to audiences.[42] In addition to a text declamation that is stuttering and rhythmically mechanical, the vocal pyrotechnics at the end of the aria (Fig 8)[43] are such that they seem unnatural, inhuman, and perhaps even signaling a technological breakdown. It is no coincidence that the voice of Olympia, and later the celesta, all undergo an "acoustic miniaturisation" that signals the little [music] box and its internal works."[44] All of these objects contain a high-pitched naivety that over time (and according to Freud, through "involuntary recurrence"), transforms into realm of the uncanny.

The fact that Olympia is destroyed at the end of Hoffmann's story also suggests another facet of the uncanny— that of death. In the article "Outside Ravel's tomb," Carolyn Abbate analyzes Olympia's technical breakdowns as a reaction to her historical impossibility: "Olympia herself as an inhabitant of her historical era— the nineteenth century— was fundamentally implausible. She was a fake or an obvious trick in a way that an android pianist was not, because a singing voice in fact could not be generated mechanically."[45] At the end of the narrative, the characters Spalanzani and Coppola tear apart the automaton after fighting over her, "reducing her to *membra disjecta* that can never be… made whole again."[46] The literal disembodiment of the automaton into its various mechanical components undoubtedly reminds audiences of a deceased human body that is no longer a whole being, but simply a collection of nonfunctioning parts. From the perspective of instrumental categories, the celesta's mechanism is analogous to Olympia's. On account of its percussive interior units, the celesta has a sharp attack and decay

41. Most sopranos augment even further the virtuosity of this aria as is written in the score; in Rachele Gilmore's 2009 debut with the Metropolitan Opera (as a last-minute substitute, no less), she spirals up to an A-flat above high C: "Rachele Gilmore - Met Debut - Olympia", YouTube video, upload by regulargonzalez on March 2, 2011, accessed February 2017, http://www.youtube.com/watch?v=CHp4LLnlKIg
42. "Voilà la chanson gentille/ La chanson d'Olympia!"
43. Jacques Offenbach, "Les Oiseaux dan la Chamille," Les Contes de Hoffmann. Score excerpt from IMSLP.
44. Abbate, 503.
45. Ibid., 483.
46. Ellison, *Sublime to the Uncanny*, 61.

and thus cannot truly sing. It is physically disembodied from the piano, considered by most to be the more natural and human instrument with its linear, sustaining sound.

IV. 20th-Century Interpretations: Beyond Death, to the Afterlife

Composers have continued to the celesta to embrace both the angelic and eerie sides of the otherworldly. From evoking the consciousness of inanimate toys to spiraling towards the breakdown of fantastical machines by the end of the nineteenth century, this sense of the uncanny was still mainly contained within imaginations. The following twentieth century examples by Berio and Feldman extends this concept by moving completely into reality. Both composers use the celesta to signal the passage of time and the death of a beloved person. Despite referencing these actual deaths, their sonic spaces are introduced with the celesta's traditional characteristics— beautiful and nostalgic, rather than explicitly grotesque.

Luciano Berio's *Rendering* for orchestra (1988-1990) is a restoration (rather than a completion or reconstruction) of Franz Schubert's sketches for a Tenth Symphony in D major, made during the last weeks of his life. As such, Berio's piece is completely informed by Schubert's untimely passing. Berio compares his compositional process to restoring an ancient fresco, by "reviving the old colours without however trying to disguise the damage that time has caused, often leaving inevitable empty patches in the composition."[47] The empty spaces left by Schubert within the piece are filled up by Berio's own music, which he calls "connective tissue" or "musical cement." These spaces occur at many intervals throughout the symphony, particularly in the second and third movements. *Rendering* is striking for its alternations between the musical language of Schubert and Berio, and therefore the piece constantly moves across wide spans of historical time. The music that occurs "in-between" Schubert's world "comments on the discontinuities and the gaps that exist between one sketch and another and is always announced

47. Luciano Berio and Franz Schubert, *Rendering,* (Vienna: Universal Edition, 1989), program notes by Berio.

by the sound of a celesta." Notably, Berio requests the part to be performed "'quasi senza suono' and without expression." For example, in the third movement, the rhythmic, climatic section spanning rehearsal no. 23-26 arrives at a *tutti* from which the celesta almost imperceptibly emerges. The celesta then acts as a faint light guiding the rest of the orchestra in the blurry, almost improvisatory character of the subsequent section (Figure 9).[48] By signaling the change at each formal junction, the celesta not only facilitates the music's modulation from classical to contemporary harmonies, but also serves as a gentle yet constant reminder that Schubert was near his death as these sketches were being composed. Quite literally, Berio places the celesta in between our awareness of Schubert's life (his realized sketches), and death (the empty spaces).

Morton Feldman's intimate chamber work, *Madame Press Died Last Week at Ninety* (1971), is written in memory of his former music teacher. It features the celesta in only two gestures, as a single arpeggio at the very beginning and at the very end— taking on an almost ritualistic function (Figure 10).[49] This rolled chord bookends Feldman's dedication and can be seen as a parentheses enclosing Madame Press's life. Although the piece consists of a sighing gesture that recurs over and over again, this musical object transforms gradually throughout the piece. In Feldman's typically subtle way, the orchestration and rhythmic context of the "sigh" is shifting constantly, suggesting that it is somehow organic and "alive." On the other hand, the celesta arpeggio in and of itself is rather wooden and inexpressive, despite the piece's overall poignancy. Feldman's piece corroborates with Berio's use of the celesta as indicator of a new musical and poetic space; it announces death, but also opens out into a place beyond death. In *Madame Press*, it is also significant that the celesta occurs completely on its own. Its specialized placement in the music prevents interaction with the other instruments, risking no dilution of its important role. The celesta contains such laden meanings that compositionally requires separation from main body of the ensemble. In this structural isolation, the celesta is again disembodied.

48. Ibid., 101.
49. Morton Feldman, *Madame Press Died Last Week at Ninety*, (London: Universal Edition, 1971), opening/ending.

Figure 9

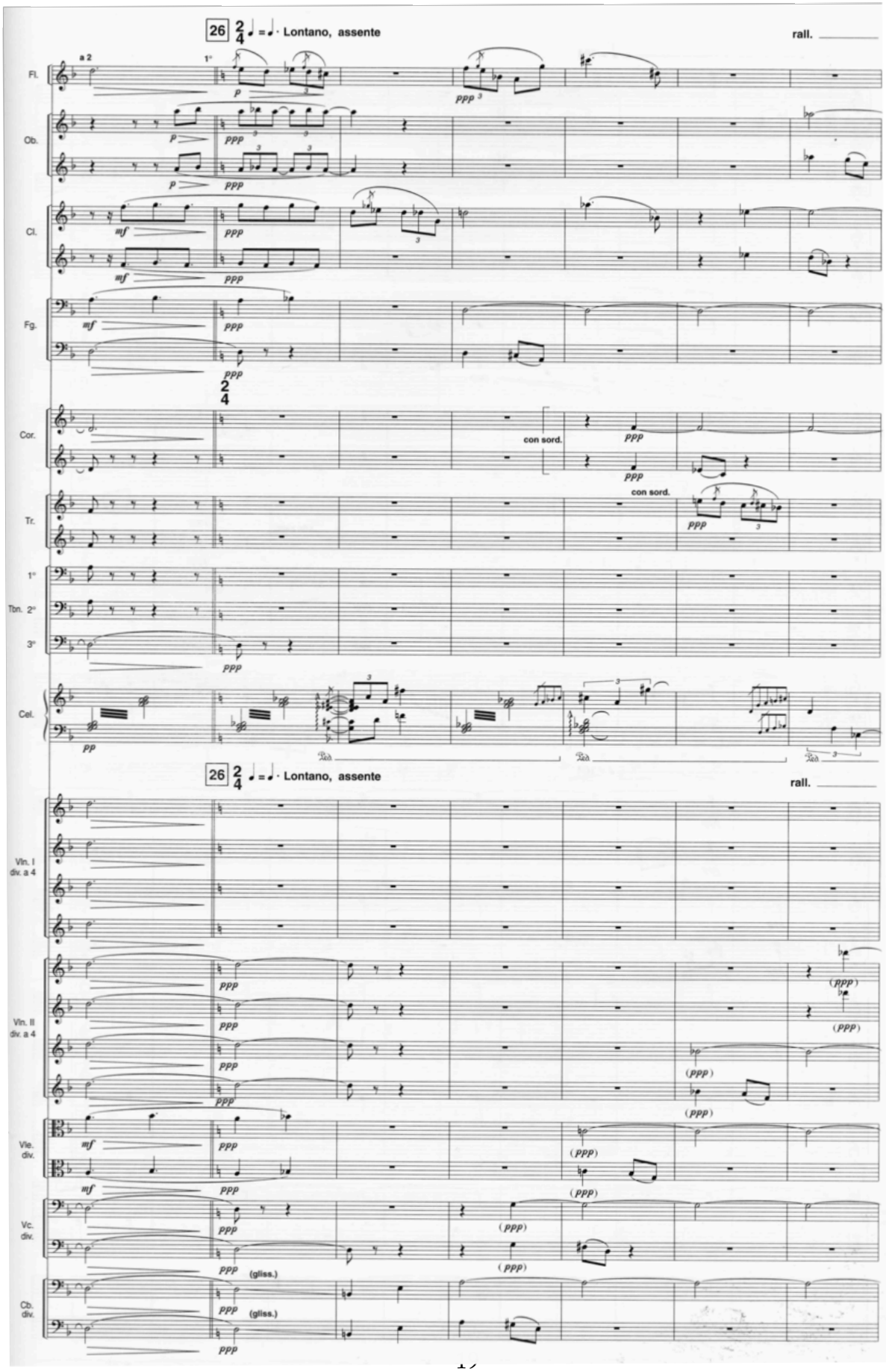
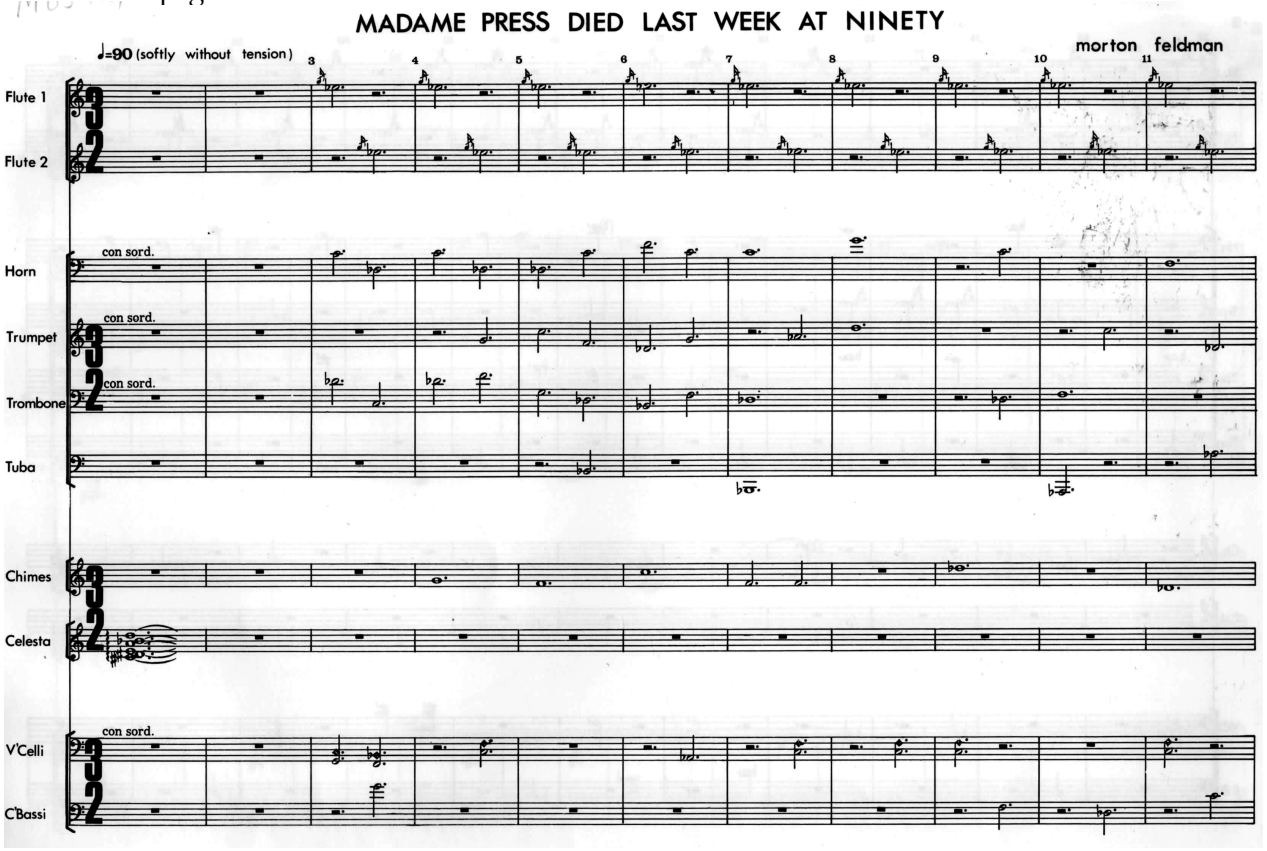
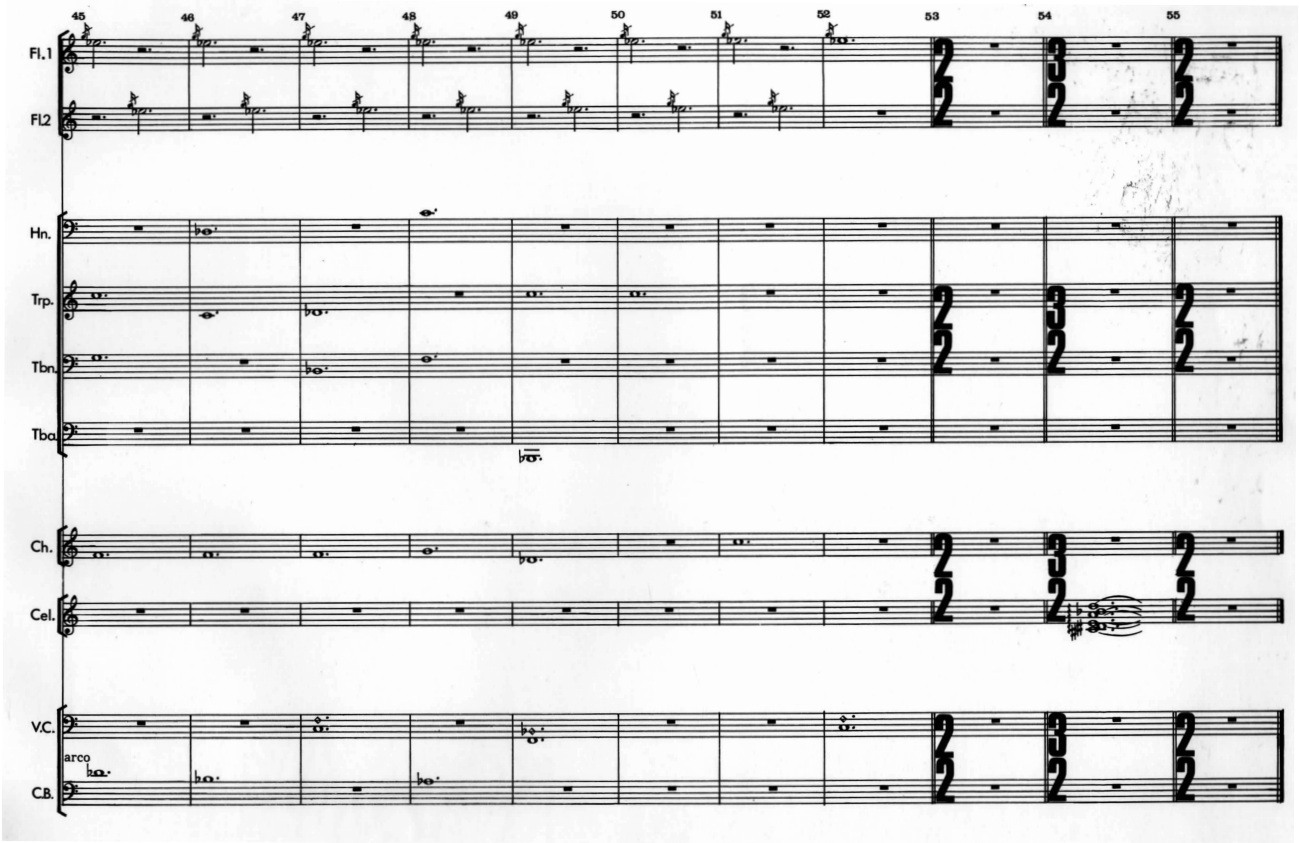

26
Lontano, assente
rall.
Fl.
Ob.
Cl.
Fg.
Cor.
con sord.
Tr.
con sord.
1°
Tbn. 2°
3°
Cel.
Vln. I
div. a 4
Vln. II
div. a 4
Vle.
div.
Vc.
div.
Cb.
div.
(gliss.)

Figure 10
first and last pages





V. Manufacturing and Performance Technique

Thee celesta's in-between qualities contribute to technical dilemmas for both musicians and manufacturers. Lacking a true place of belonging, both mechanically and musically, performers who encounter the celesta are unlikely to take ownership of it. First of all, celestas are generally owned by institutions and rarely by individuals. The celesta was developed and promoted solely as an orchestral instrument. And while almost all orchestral percussionists own a marimba or vibraphone, one would be hard pressed to find an orchestral keyboardist with a personal celesta. The current manufacturers proudly proclaim their institutional affiliations on their websites, rather than specific artists. Both Yamaha[50] and Schiedmayer Celesta lists professional orchestras and many important musical associations. Below the professional level, most musicians encounter celestas at universities. There are usually one or two of these instruments at each conservatory or music department, and they are often poorly maintained.

The celesta does not have a large body of solo or chamber repertoire— with this lack of performance tradition comes a dearth of dedicated specialists. There are no self-identified "celestists," as there would be harpsichordists, organists, or fortepianists. Therefore, the performer always approaches the celesta as somewhat of an outsider. Along with almost exclusively institutional ownership of the instruments, this perpetuates a cycle of isolation on various levels. Without dedicated performers, there is less need for skilled technicians, who are able to maintain celestas properly. In addition to these figurative issues of ownership, the dual nature of the celesta as both percussion and keyboard instrument also explains some technical challenges for the performer on a physical level.

The performer's technical difficulties on the celesta are almost always concerned with touch. Historically, and certainly from a percussionist's point of view, the celesta's keyboard

50. "Yamaha celestas… are actively used by the Vienna Philharmonic, the Metropolitan Opera, the Leipzig Gewandhaus Orchestra, the London Philharmonic Orchestra, the Orchestre Philharmonique de Radio France, the Orchestre de la Suisse Romande, the NHK Symphony Orchestra…" http://usa.yamaha.com/products/musical-instruments/percussions/celesta/

interface is a great asset. Rather than playing with (at the very most) four mallets, using ten fingers allows for more detailed and nuanced control, and therefore more potential virtuosity. In his discussion of the glockenspiel, James Blades identifies notable works in the standard repertoire that uses keyboard action: "In certain works the part for glockenspiel was obviously written for an instrument with pianoforte action, as with Papageno's little bells (Magic Flute). Respighi writes similarly pianistically in the Pines of Rome…the florid writing in The Sorcerer's Apprentice (Dukas) was at one time generally considered to be 'a job for the keyboard'."[51] Yet, if one approaches the celesta with the expectation of a grand piano's dynamic expressivity, disappointment at the instrument's lack of "actual" keyboard virtuosity is based on a false corollary. For many, the celesta's familiar keyboard interface belies what has been criticized as a one-dimensional quality to the sound. Yamaha's criticism of Mustel's original design (though perhaps a marketing ploy against the Schiedmayer model), echoes many common complaints of pianists attempting to play the celesta:

> Mustel's celesta suffered from a number of limitations. His design tended to be very simple as the hammers were suspended by springs and propelled downward to produce the sound. Moreover, there was no piano-type action. The musician had to hit the keys fairly hard to get the sound out and therefore it was quite difficult to play rapid passages. Effective control of volume was also quite difficult. Performers may also have had problems to maintain smooth dynamics as they moved across the keyboard.[52]

In other words, the performer usually finds little expressive means on the celesta besides adding its inherent color to the ensemble. Since there is no tradition of technique or pedagogy, performers rely on their skills acquired from piano playing and modify technique based on individual experience. Mary Hoffer articulates performers' common reactions to playing the celesta and offers some advice on how to manage this difference in touch:

> On many celestas, the sound is made at the bottom of the key stroke. If piano technique is applied to these instruments, a rather dull tone is created, and the player risks injury from 'key bedding.' The proper technique involves a small striking motion of the finger or

51. Blades, *Percussion Instruments*, 399.
52. Yamaha Corporation website, "An Overview of Yamaha Celestas."

> wrist for each note followed by the release [of] any pressure the instant the sound occurs: aiming for the sound. A vertical motion is necessary for clarity and for predictable timing; typical piano fingerings are often unsuccessful. Choosing fingerings that stay within five-finger patterns aid this technique. With experiment, the pianist will discover a variety of tone qualities and a small, but useful, dynamic range.[53]

Although it might seem counterintuitive for a pianist, the celesta player can learn from mallet percussion technique, with its aims of vertical motion and allowing the sound to ring using a quick release of contact. Unlike Hoffer and other celesta players, who seem to have arrived at these technical solutions in relative isolation, percussionists have been developing performance methods within a larger community where specialization on any one instrument is rare. In the *Percussion Anthology*, a compilation of percussion-related articles from the 1950s-1980s, mallet technique is described in detail in several articles. One in particular echoes Hoffer's observations, "The wrists should be as relaxed as possible; they do all the up and down movement, not the arms. The back of the hand should always be facing upwards, and the mallets should leave the bar as soon as they strike, as if to draw the tone out of the bar."[54] Combining elements from both percussion and piano technique might be a sensible first step in acquiring a more satisfying playing technique for the celesta.

Australian composer Elliot Gyger's account of composing his concerto for celesta and chamber orchestra, *Angels and Insects* (2010), echoes Hoffer's keyword for successful celesta playing: experimentation. While his title still reflects the two sides of the instrument's musical "personality" as explored earlier— the angelic and macabre— Gyger's compositional approach attempts to break free of the celesta's one-sided reputation. He writes, "The celesta is most often thought of as a special effect, a distinctive orchestral colour but pretty much a one-trick pony. However, a survey of the great celesta passages… reveals more potential variety than one might at first suspect— from glittering virtuosity to icy calm, playful grace to eerie radiance— and

53. Mary Pendleton Hoffer, "The Orchestral Keyboard: A Practical Guide for Pianists," (DMA Dissertation, Arizona State University, 2003), 68.
54. Mario Gaetano, "Teaching mallet Instruments to Beginners," May 1980, *Percussion Anthology: A compendium of percussion articles from the Instrumentalist,* 3rd ed*, (*Evanston: The Instrumentalist Company, 1984), 601.

experimentation with the instrument itself opens up further possibilities."[55] In addition, Gyger explores musical gestures that work particularly well for the instrument, that is, to write idiomatically for the celesta specifically rather than for a generic keyboard part. He gives a helpful list of the celesta's limitations and capabilities:

- Its timbre and attack characteristics vary considerably across the range, from mellow and almost "woody" at the bottom, through clear and well-rounded in the middle, to a definite metallic edge at the top. Standard orchestral and chamber writing makes little if any use of these registral contrasts.

- Unlike on the piano, depressing the sustain pedal makes absolutely no difference to the colour; the celesta's metal bars are too rigid to create any sympathetic resonance.

- The dynamic range of any given note is quite narrow, but there is a direct correlation between the number of notes struck and the volume of the sound (as with the harpsichord and the organ). The composer must therefore take density and chordal spacing into account in order to create stronger dynamic contrasts.

- Rapid repetition of a single note can be problematic, as the escape action is not well developed and regulated; repeated attacks can actually have the result of damping the sound. On the other hand, trills and tremolos are extremely effective — and indispensable in building up the fullest possible sonority.

- Almost all celesta writing in the standard repertoire is homophonic; the melody and accompaniment texture in the Dance of the Sugar Plum Fairy is atypically contrapuntal! However, the instrument is capable of considerably more developed textures, within the limits of the relatively short sustain time.[56]

Gyger's concerto *Angels and Insects* represents a significant effort in soloistic writing for the celesta. While he acknowledges the instrument's mechanical difficulties, he attempts to transform those limitations into compositional assets. Being aware of physical acoustics throughout the compositional process allowed Gyger to write a celesta part containing much gestural variety. His observations about the celesta from a composer's perspective can also help

55. Elliott Gyger, "A concerto for a one trick pony-exploring the celesta," *Australian Music Centre: Resonate Magazine*, September 27, 2010, http://www.australianmusiccentre.com.au/article/a-concerto-for-a-one-trick-pony-exploring-the-celesta.
56. Ibid.

the performer, whose challenges are many. By focusing on the instrument's unique capabilities, a composer can explore the celesta's traditional idioms with an expanded range of technical means.

Today's celestas vary considerably depending on the manufacturer, adding to performers' difficulties. Unlike the piano, which has been standardized to a great degree by Steinway & Sons, the celesta's interior mechanism, exterior materials, key sizes and weight can differ between instruments. Thus, despite surface similarities, the contemporary celesta is perhaps more identifiable by its sound rather than by its physical "body." With this lack of standardization, the celesta is similar to historical keyboard instruments such as the fortepiano, or more recent percussion instruments such as the marimba. The performer needs to quickly adapt to the individual physicality of each celesta he encounters.

There are currently two basic models of celestas, manufactured by three makers: Schiedmayer, Yamaha and Kolberg. When the Mustel workshop halted production of celestas (as well as all other musical instruments— they now make radio parts) in the 1970s, Schiedmayer became the sole manufacturer to produce celestas according to the inventor's original design— that is, with the hammers hitting the steel bars from above (Figure11).[57] Founded in 1809, the Schiedmayer family began making celestas in the 1890s, soon after the instrument's invention. However, they also built many other keyboard instruments, such as organs, harmoniums, and pianos. In 1969, the firm, previously known as J &P Schiedmayer Pianofortefabrik, began to make celesta manufacturing their primary focus. Re-established as Schiedmayer Celesta in 1995, the headquarters are currently located in Wendlingen am Neckar, Germany.[58]

As more recent additions to the scene, both the Yamaha Corporation and Kolberg have dramatically changed the celesta's inner mechanics. The metal bars of these newer celestas are struck from below, as in a grand piano. Thus, the entire mechanism is shifted around, with the

57. "Schiedmayer Resonator Boxes in Schiedmayer Celesta," by Frans van der Grijn at the Schiedmayer factory, June 28 2009, http://www.harmoniumnet.nl/Schiedmayer-details_celesta_resonators.html

58. Schiedmayer Celesta Company, "Mustel," and "Schiedmayer," 2011, accessed April 2014, http://www.celestaschiedmayer.info/index

Figure 11

resonators now resting on top of the bars. Yamaha began developing their own celestas after being requested to repair an original Mustel instrument in 1989. Their instruments began production in 1992 and are products of a joint collaboration between their Percussive Design Department and Piano Development divisions. The company lists the advantages of their celestas as: action identical to grand piano (Figure 12),[59] full piano-sized keys, higher volume and resonating power for orchestra settings, and the ease with which any piano technician can work on it. Yamaha clearly markets their celestas for playability and convenience.

Kolberg also claims to have re-invented the celesta in similar ways (Figure13). Their catalogue expresses their celestas' affinities with the grand piano and emphasizes the way each resonator has been adjusted to achieve "maximum sound volume." Deviating even further from the original design, Kolberg uses a "special alloy" for the sound-producing bars instead of steel.[60] Ironically, despite all their efforts to create a celesta that is mechanically as similar to a piano as

59. Yamaha Corporation, "An Overview of Yamaha Celestas," http://usa.yamaha.com/products/musical-instruments/percussions/celesta/

60. Kolberg Company, "Celesta 5 octaves f - f5," Kolberg Percussion, 2003, http://products.kolberg-percussion.com en_GB/462/product/565.html#

Figure 12

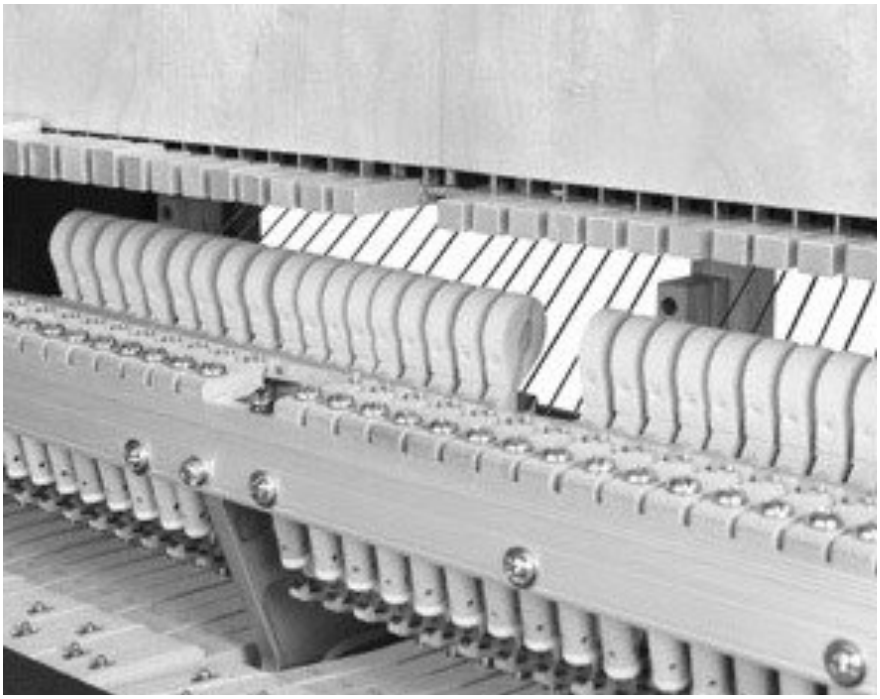


Figure 13

possible, both Yamaha and Kolberg classify them on their websites as percussion instruments, continuing the tradition of older orchestration books. In fact, Kolberg is solely a percussion manufacturer, with no historical ties to making keyboard instruments.

These recent changes no doubt accommodate many performers' expectations of the celesta, making the instrument more accessible to pianists. However, they reveal a fundamental emphasis on the celesta's various inadequacies, or "disabilities" which need to be amended. As with other relatively new instruments experiencing growing pains, the question of whether these mechanical changes are improvements or detriments needs to be considered carefully. There has been no study to date on how such alterations affect the sound of the celesta as compared to the original design; certainly the timbre of an instrument will change if its sounding materials are different (e.g., Kolberg's metal alloy). The shortcomings of the celesta are cultural artifices that stem from our society's deep familiarity with the piano. Because the piano has become a comparative model for all other keyboard instruments, the celesta's differences are viewed as faults. In Joseph Straus' discussion of disability in music, he writes that, "within a social or cultural model, disability is understood as constructed rather than given— it emerges from the activities of human beings in relation to each other and to the culture and built environment they inhabit, not from the medical pathology of an individual body."[61] This can be applied to a typical view of the celesta, replacing the subject of the human performer with the instrument itself. The celesta's so-called problems have been assigned within a social, comparative context and are not native to its own physical "body." By viewing the original celesta as an inherently flawed object, Yamaha and Kolberg perhaps fail to recognize that its "in-between" qualities is exactly what make it valuable and unique.

Mirroring the recent efforts to manufacture celestas for pianists, many orchestration books discuss both instruments in the same chapter. In Kent Kennan's book, the celesta is

61. Joseph N. Straus, *Extraordinary Measures: Disability in Music*, (New York: Oxford University Press, 2011), 127.

grouped under the heading "Harp, Celesta, Piano," with the following explanation: "The harp, celesta, and piano have been allotted a special chapter because they do not belong in any of the four orchestra groups [strings, winds, brass, percussion] already discussed. Although the harp and the piano have strings… their tone is not produced by bowing. The celesta is listed with the percussion group in some orchestration books, but it is not normally played by a member of the percussion section."[62] Similarly, Samuel Adler's classification system addresses the performer of the celesta, rather than focusing on its mechanical properties. His book has a separate chapter for keyboard instruments, which includes the piano, celesta, harpsichord, organ, and harmonium.[63]

By replacing its unique mechanism with that of a piano's, as well as classifying it as such, some modern celestas conform to its more widely accepted relative in the keyboard world. They become viewed as a miniature pianos, rather than small musical machines in their own right, as descended from the sounds of the music box. In contrast, perhaps because of its "privileged" status as the predecessor to the piano, the harpsichord has no problem retaining its unique plucking mechanism despite the popularity of the piano. These "normalized" celestas, which have permeated institutions since the 1990s, diverges from the instrument's historical origins in both the mechanical and percussive aspects.

62. Kennan, *Technique of Orchestration*, 273.
63. Samuel Adler, *The Study of Orchestration,* 3rd edition, (New York: W.W. Norton, 2002), 275.

VI. Alternative Roles

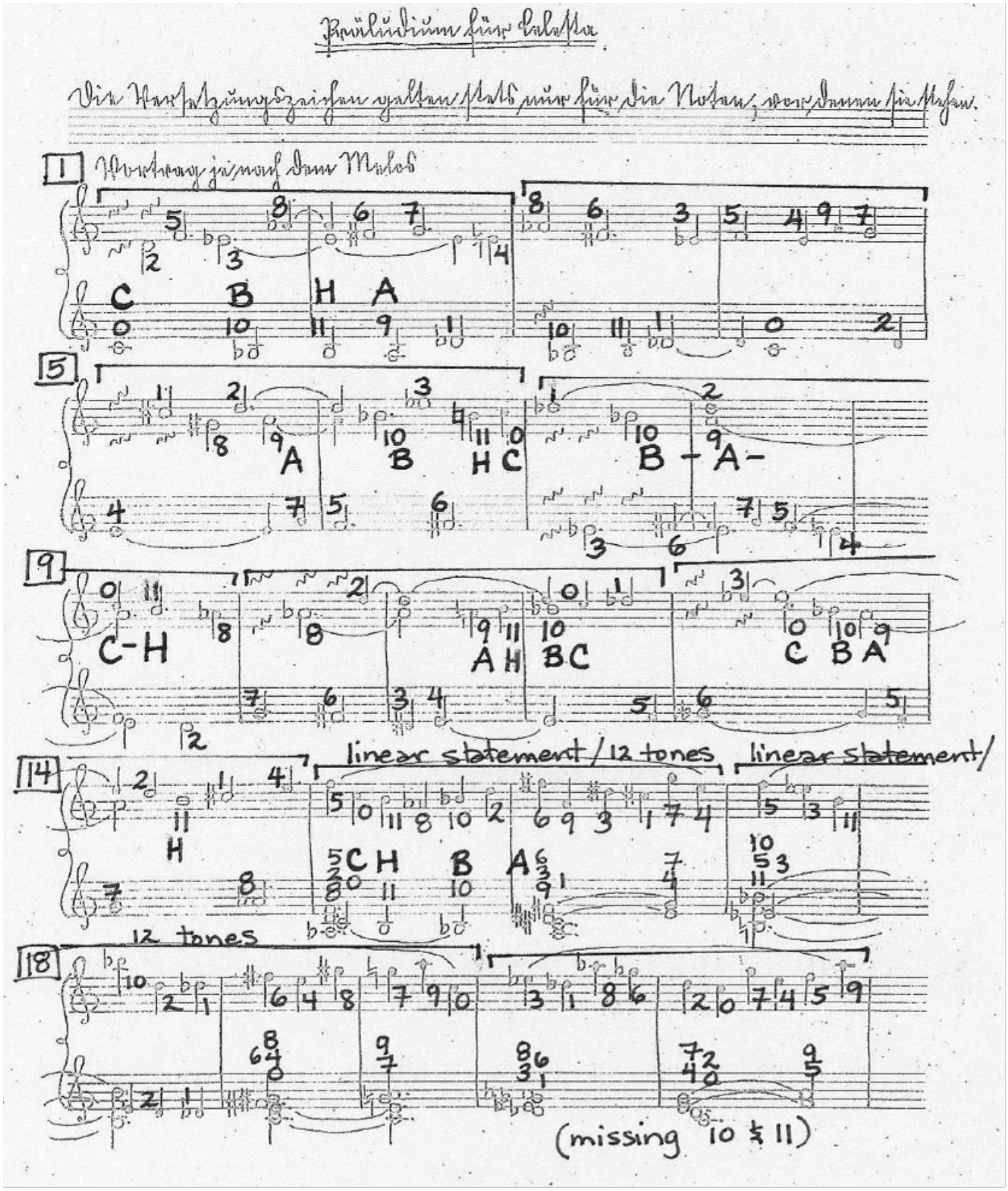
All of these practical issues, along with engrained concepts of what the celesta sound evokes, tends to limit the types of music written for it. Despite having a history of over a hundred years, pieces that have broken out of the celesta's established idioms are still in the minority. Having been used extensively as a "special" orchestral color for so many decades, the celesta has only recently begun to explore a more prominent role in solo and chamber music. With more options of manufacturers and technical specifications today, the celesta will hopefully gain wider popularity and usage. The following three examples offer what I believe are alternatives to its traditional place along the spectrum of the "uncanny," as described by Freud. Despite the extremely wide expressive range of this idiom, it is an aesthetic that has dominated composers' approach to the celesta.

Josef Mathias Hauer's *Präludium für Celesta* (1921) uses the qualities of the instrument to convey an abstract compositional idea (Figure 14). By focusing on the objective, rather than assigning a subjective meaning to the music, the piece neutralizes the celesta's traditional musical idioms. Although the listener, conditioned by previous associations, may instinctively assign specific meanings to the sound, this piece is an unusual case where the celesta is used in an explicitly non-programmatic setting. Despite its simplicity, Hauer's use of twelve-tone aggregate fields (stacking them vertically as well as horizontally as blocks) prompted Schoenberg to publicize his theories for priority's sake.[64] The piece owes its charm to the acoustical capability of the celesta to accumulate sound— the result contains a beating not unlike the vibraphone with the motor on. This effect, particularly heard starting in m. 15, is simply not reproducible on the piano.[65] We cannot be sure whether Hauer conceived of this prelude specifically for the celesta, or whether it was simply a template on which he worked out his theoretical ideas. However, as a

64. Deborah H. How, "Arnold Schoenberg's Prelude from the Suite for Piano, Op. 25: from composition with twelve tones to the twelve-tone method," (Ph.D. dissertation, University of Southern California, 2009), 128.

65. Recording at http://atom.oaw.mediathek.at/atom/15E9E3E8-325-000B0-00000EBC-15E91EC7/?em=1

Figure 14


linear statement / 12 tones
linear statement /
12 tones
(missing 10 & 11)

rare contribution to the celesta's solo repertoire, the *Präludium*'s conscious avoidance of the aforementioned musical idioms is striking.

In *Ave* (1987), for piccolo, glockenspiel and celesta, Franco Donatoni frees the celesta from its traditional functions by placing it with near-equals. Without the pressure to conform to its usual tropes, the celesta is free to explore a new kind of "self-expression" by engaging in imitate dialogue with the piccolo and glockenspiel. Donatoni asks the player for a virtuosic combination of scales and chords, notating a specificity of articulation and dynamics usually not seen in celesta parts. A large variety of attacks and releases are demanded of the performer, exemplifying the expanded technique and idiomatic writing advocated by Gyger. For example, the opening (Figure 15)[66] features quick legato runs that are familiar gestures in the celesta's standard repertoire. At the end of m. 25 (Figure 16), an extreme contrast occurs; the celesta now plays soft staccato chords in the little-explored low register, punctuating the piccolo melody. This gesture and the resulting timbre create an opposite effect from the expectation (conveyed in the previously mentioned orchestration textbooks) that a celesta should always "sparkle" within an ensemble. Later on, in m.60 (Figure 17), this type of delicate staccato playing is turned on its head. With markings of *fortissimo* and added accents, celesta is asked to bring out its percussive and metallic qualities in order to match the timbre of the glockenspiel. With the exception of some brief piccolo solos, each instrument always appears alongside another, whether sharing the same types of gestures or participating in a melody/accompaniment relationship. This reveals a main concern in this piece to create a fused ensemble sound through the combination of instruments.

Donatoni's characteristic rhythmic language of intricate hocketing, combined with his penchant for formal sections that repeatedly state the same "panel" of music, create a sense that this ensemble is indeed a small, yet complex musical machine not unlike a music box. However, instead of depicting the sound product of such an apparatus, the piece focuses on the intricacies

66. Franco Donatoni, Ave, (Milan: Ricordi, 1987).

Figure 15

m.1-3

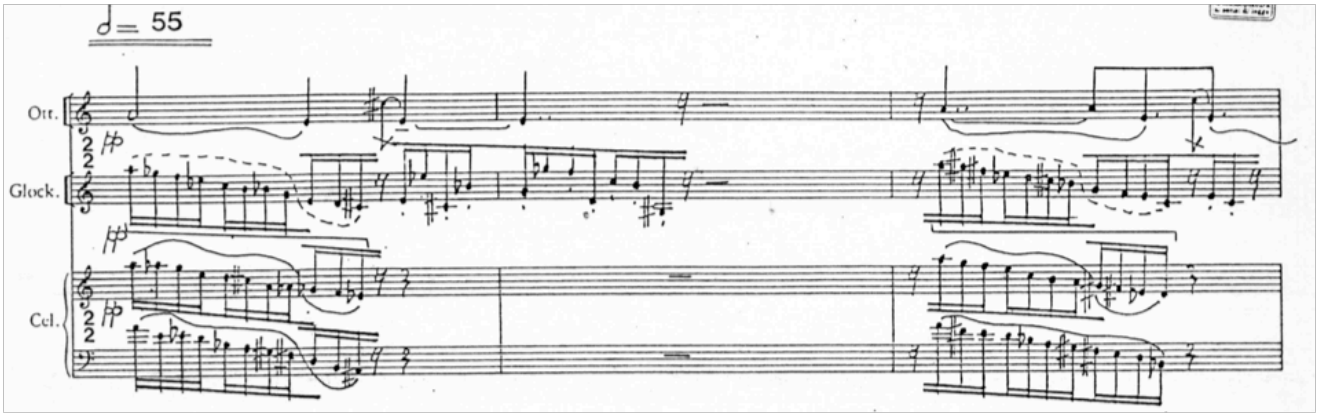


Figure 16

m.25-27

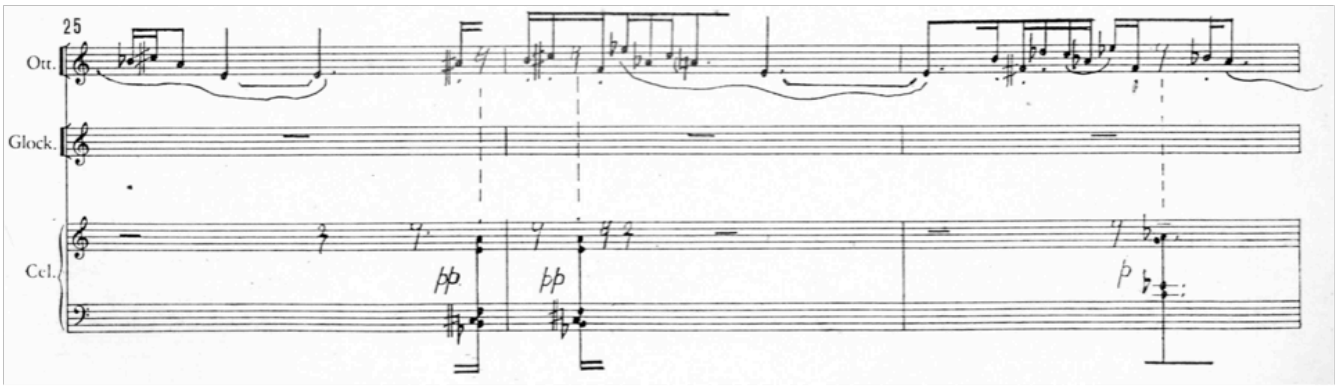


Figure 17

m.60-61

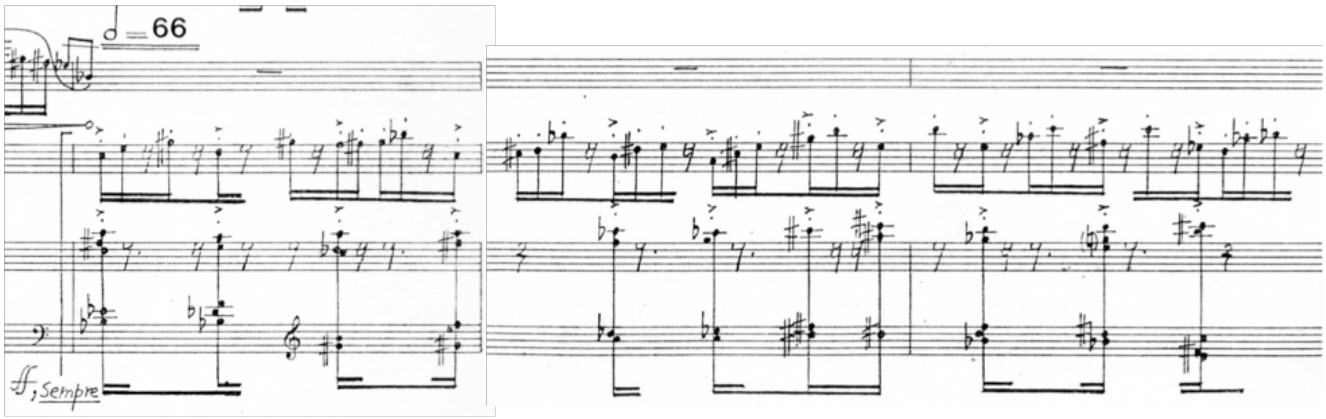
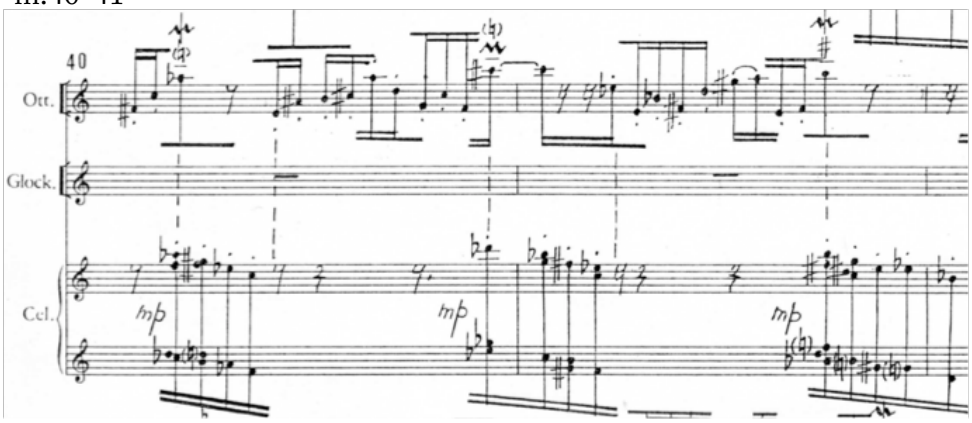


Figure 18

m.40-41

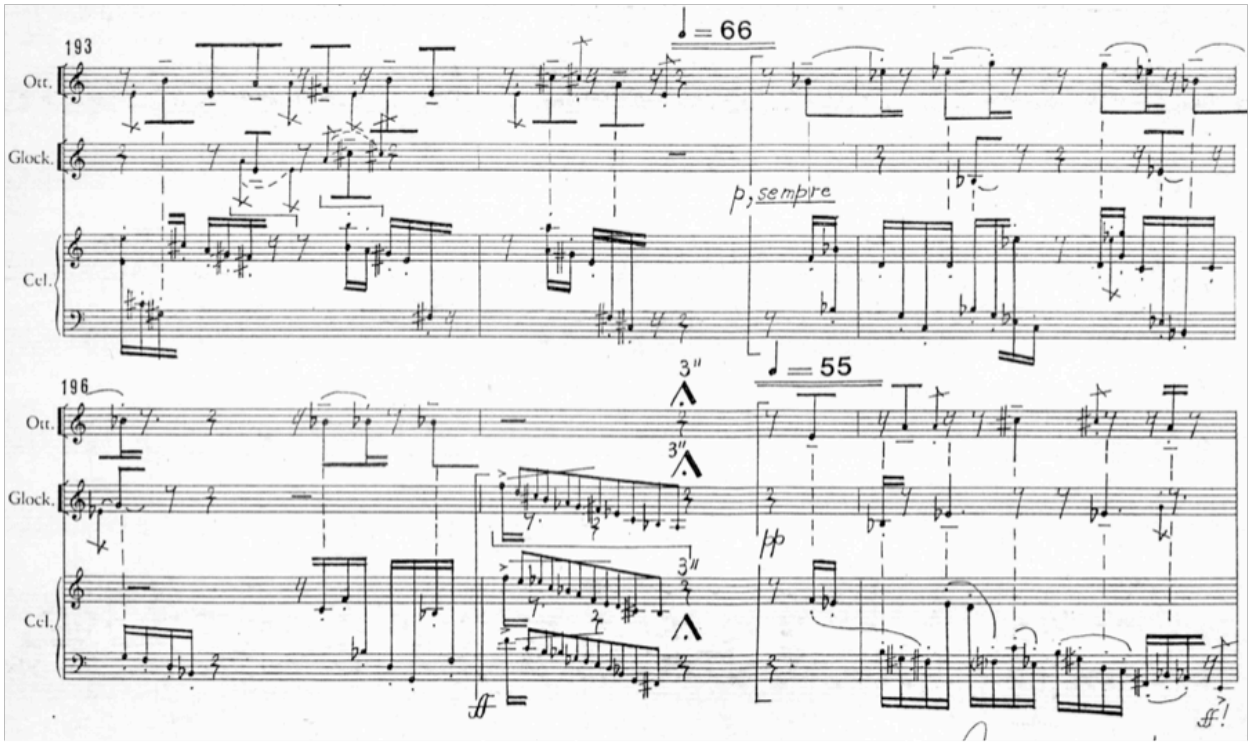


of machinery itself— the idea that each individual part is essential for the successful functioning of the whole. Furthermore, the piece features almost a baroque sense of ornamentation, imitation and invertible counterpoint (Figure 18), further highlighting the instruments' collaboration as equals within this musical space. Although the overall character of the piece is whimsical, after the initial marvel at the unusual timbre, the listener soon becomes equally fascinated with Donatoni's extensive transformation and creative re-contextualization of the opening material. In other words, while the celesta is essential to the piece, it is the composer's active engagement with it that creates meaning, and not simply the sound of the instrument. Towards the very end of the piece, starting at m. 187, the ensemble is reduced to what sounds like "music-box music"— perhaps a tongue-in-cheek reference to the cliché that is promptly destroyed (Figure 19).

In contrast to Hauer's neutral attitude towards the celesta's traditional idioms in the *Präludium*, Salvatore Sciarrino's *Lo spazio inverso* (1985) expresses defiance towards them. In this work for flute, clarinet, celesta, violin, and cello, the music is pervaded by a static texture stemming from a clarinet multiphonic. Throughout the piece, the other instruments gently comment on the sustained tones of the clarinet with air sounds and harmonics. Sudden entrances of the celesta interrupt this calm ambiance at irregular intervals; the surprise is augmented

Figure 19

m.193-end



through the use of clusters and frenetic rhythms. Furthermore, the high pitch and piercing timbre of the celesta are an extreme contrast to the intervening material, producing a jarring effect. In this way, Sciarrino assigns a violent role for the celesta; its music literally violates the calm around it. The instrument eschews its usual rhetoric within the realm of the strange-but-beautiful. Here, the aggressive, physical nature of the celesta writing is unsettling and verges on grotesque, drawing on the longstanding association of the celesta and the uncanny. This particular quality of the celesta informs the emotional progression of the piece. Although the two types of music (the static and the violent) are initially kept separate and do not interact (Figure 20),[67] the celesta's rude intrusions on the texture begins to subtly affect the sustained music and, among other changes, lead to higher rhythmic activity in the other instruments. Immediately after the celesta's most intense outburst between m. 29-31(Figure 21), the pitch stability of the calmer music

67. Salvatore Sciarrino, "Lo Spazio Inverso," *Sei Quintetti 1984-1989*, (Rome: Ricordi, 2002), 42.

Figure 20

m.1-10

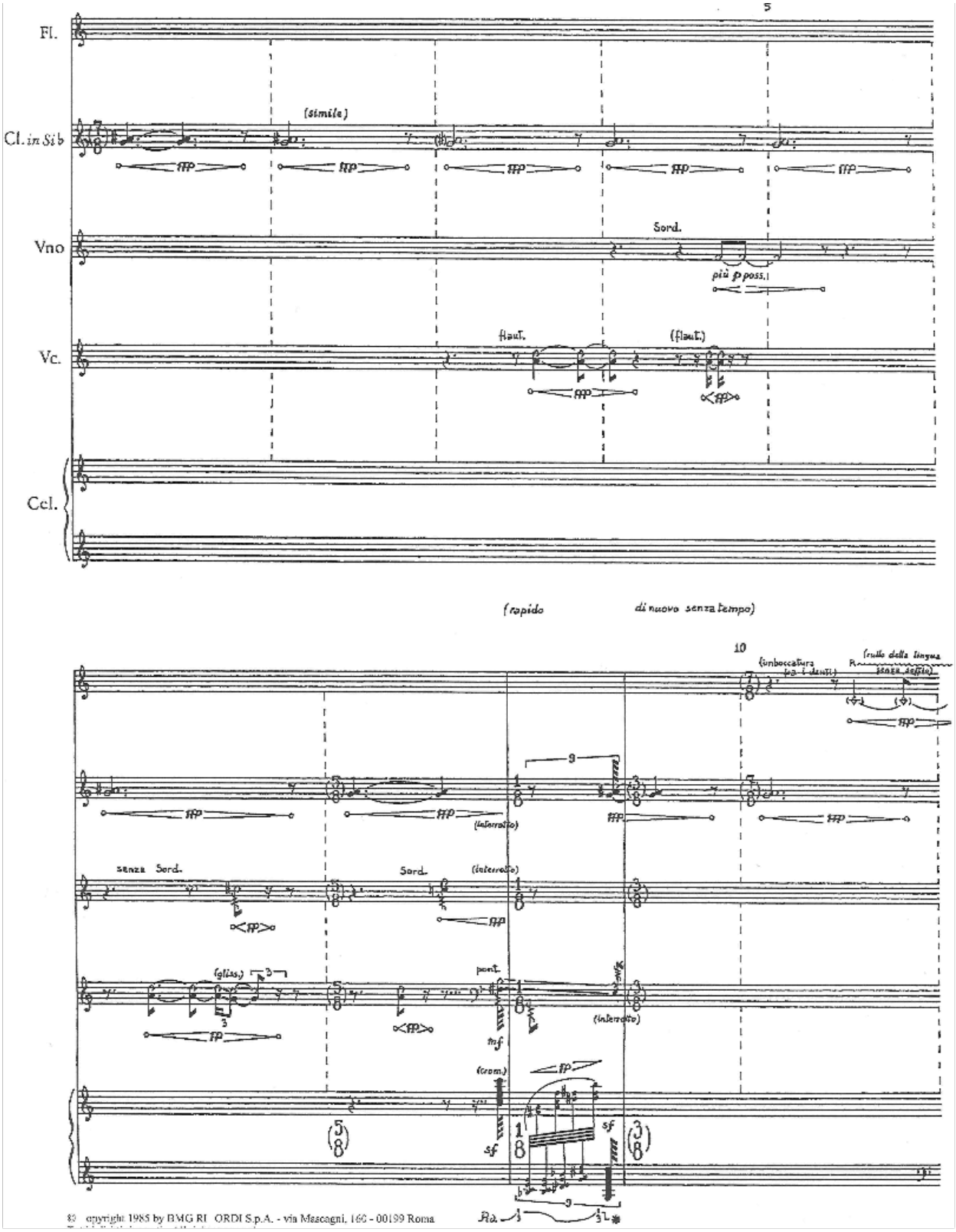
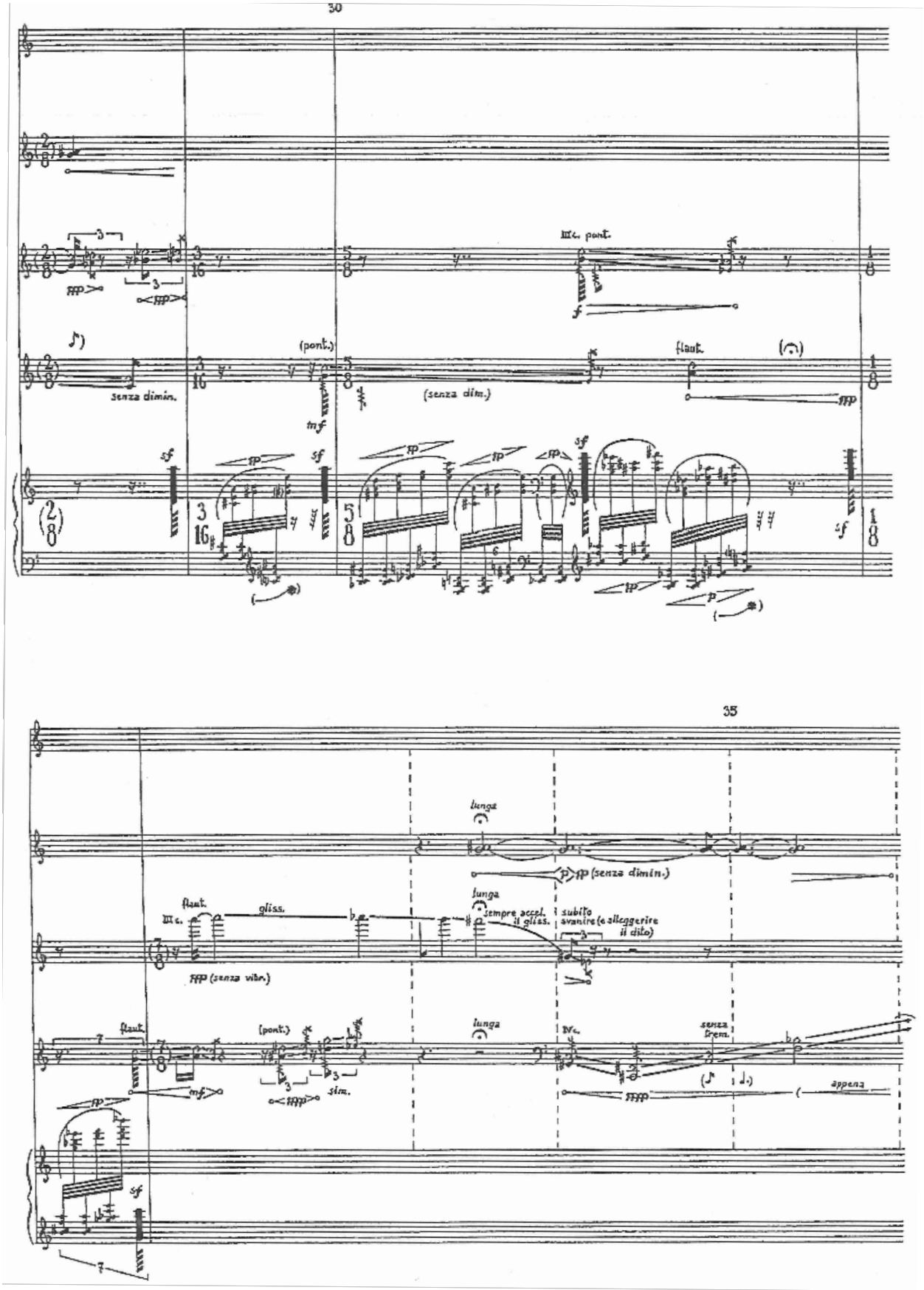


Figure 21

m.28-35



begins to waver, manifesting in the form of string *glissandi* over large intervals (the entire length of the C-string, in the case of the cello). When the celesta enters again in m. 37, the other instruments react to the gesture by being its resonance, slightly echoing the celesta's zigzag contour and quick rhythms. Sciarrino's interpretation of the celesta sound does not ignore its connection with the uncanny, but rather explores a grotesque and perhaps even fear-inducing facet of the idiom. Sciarrino's imagination of an "inverse space" therefore also contains an inverted role for the celesta.

Sciarrino's *Lo spazio inverso,* along with the other works discussed here, show a complex relation to the instrument's mechanical qualities, sonorities, and historical resonances. In each of these categories, the celesta is not easily definable. It is an instrument inspired by a machine, combines features of two instrumental families, and traditionally occupies a poetic space where childhood and death are one and the same. Although the celesta is commonly misunderstood or simply not thought much about, there are numerous narratives behind its attractive sound. Its musical idioms grew out of a very specific aesthetic that permeated much of its repertoire, from Tchaikovsky's fanciful ballet to Feldman's sparse eulogy. However, the pieces by Hauer, Donatoni, and Sciarrino provide clues for how composers can continue to interact with the instrument's rich tradition, whether by extending its historical meanings or defying them.

BIBLIOGRAPHY

Abbate, Carolyn. "Outside Ravel's Tomb". Journal of the American Musicological Society, Vol. 52, No. 3 (Autumn, 1999), p. 465-530.

Adler, Samuel. *The Study of Orchestration,* 3rd edition. New York: W.W. Norton, 2002.

Berio, Luciano and Franz Schubert. *Rendering*. Vienna: Universal Edition, 1989.

Berlioz, Hector. Revised by Richard Strauss, translated by Theodore Front. *Treatise On Instrumentation*. New York: Edwin F. Kalmus, 1948.

Blades, James. *Percussion Instruments and their History*. New York: Frederick A. Praeger, 1970.

Campbell, Murray, with Clive Greated, and Arnold Myers. *Musical Instruments: History Technology and Performance of Instruments of Western Music.* New York: Oxford University Press, 2004.

Clark, John E. T. *Musical Boxes: A History and an Appreciation*. London: The Fountain Press, 1952.

De Waard, R. *From Music Boxes to Street Organs*. Translated by Wade Jenkins. Vestal: The Vestal Press, 1967.

Donatoni, Franco. *Ave.* Milan: Ricordi, 1987.

Ellison, David R. *Ethics and Aesthetics in European Modernist Literature: from the Sublime to the Uncanny*. New York: Cambridge University Press, 2001.

Feldman, Morton. *Madame Press Died Last Week at Ninety*. London: Universal Edition, 1971.

Forsyth, Cecil. *Orchestration*. London: Macmillan and Co., 1914.

Freud, Sigmund. "The Uncanny". Translated by Alix Strachey. *Imago*, Bd. V., 1919; reprinted in Sammlung, Fünfte Folge.

Gaetano, Mario. "Teaching mallet Instruments to Beginners." May 1980. *Percussion Anthology: A compendium of percussion articles from the Instrumentalist, 3rd ed.* Evanston: The Instrumentalist Company, 1984.

Gyger, Elliott, "A concerto for a one trick pony- exploring the celesta". *Australian Music Centre: Resonate Magazine*, 2009. Accessed February 2017. http://www.australianmusiccentre.com.au/article/a-concerto-for-a-one-trick-pony-exploring-the-celesta.

Hoffer, Mary Pendleton. "The Orchestral Keyboard: A Practical Guide for Pianists." D.M.A. Dissertation, Arizona State University, 2003.

Hoffmann, E.T.A. "The Sandman". Translated by John Oxenford. 1816.

How, Deborah H. "Arnold Schoenberg's Prelude from the Suite for Piano, Op. 25: from composition with twelve tones to the twelve-tone method." Ph.D. Dissertation, University of Southern California, 2009.

Kennan, Kent and Donald Grantham. *The Technique of Orchestration, 4th edition*. Englewood Cliff: Prentice Hall, 1990.

Kolberg Company. "Celesta 5 octaves f - f5." Kolberg Percussion, 2003. Accessed April 2014. http://products.kolberg-percussion.com/en_GB/462/product/565.html#

Riley, Terrence. "Composing for the Machine". *European Romantic Review* 20, no. 3, (2009): p. 367-379.

Schiedmayer Celesta GmbH. 2011. Accessed April 2014. http://www.celesta-schiedmayer.info/

Sciarrino, Salvatore. "Lo Spazio Inverso." *Sei Quintetti 1984-1989.* Rome: Ricordi, 2002.

Straus, Joseph N. *Extraordinary Measures: Disability in Music*. New York: Oxford University Press, 2011.

Tschaikowsky, Peter Iljitsch. "Casse-Noisette." Suite from the ballet The Nutcracker: for orchestra. Wiesbaden: Breitkopf & Härtel, 1993

Yamaha Corporation of America and Yamaha Corporation, "An Overview of the Yamaha Celestas." 2013. Accessed April 2014. http://usa.yamaha.com/products/musical-instruments/percussions/celesta/

ACTS OF ENVELOPMENT:
IMPLICATIONS OF TOUCH IN JUDY DUNAWAY'S WORKS FOR BALLOON

For most musicians, physical experience is a means to an end. Performers move their bodies in specific ways in service of producing a particular sound. They become experts on operating intricate tools and mechanisms in order to perform the intangible phenomenon of music. Most composers today manipulate sound through the filter of a written score and the interface of a computer. Beyond the creative stage, ingrained customs in classical music have also kept this art form detached from physicality. These practices, simultaneously upheld and critiqued, include the growing physical proximity between audience and concert stage over time, formal rituals required of concert-goers, and rise of hyper-complexity in contemporary music, leading to its withdrawal into academia during the twentieth century. More recently, the rise of computer music has led to a subset of repertoire that is acousmatic— exclusively heard, but not seen or felt— somehow recalling the ancient notion of the intangible "music of the spheres."

Touch is often a unifying theme in experimental music, particularly of the United States. The composers of this diverse category react against such forces that, at their worst, distance the musical product from the very humans who create and consume it. Between the 1950s and 1980s, numerous examples abound of works that reclaim and highlight the primacy of physical experience in music. This attitude that "true art should be directed toward, and drawn from, one's everyday life and experience" defined those that came to be known as the Downtown composers in New York City.[1] John Cage's chance compositions challenged existing conventions he saw as rigid and impersonal. Works such as the *Variation I* and *Water Walk* require diligence in small physical movements in addition to choreography of the whole body.[2] Pieces such as Steve Reich's

1. Kyle Gann, "The Importance of Being Downtown," from *Music Downtown: writings from the Village Voice*, (Berkeley: University of California Press, 2010), 6.
2. James Pritchett, *The Music of John Cage*, (New York: Cambridge University Press, 1996), 132-3 and 135-6.

Music for Eighteen Musicians and Terry Riley's *In C* were in part reactions against the inaccessibility of total serialism— attempts to better reflect the composers' own cultural experiences. With the aid of modern technology, Alvin Lucier dissolved his own voice and made music with brainwaves. Further tackling the invisible "ghost in the machine," Pauline Oliveros' Deep Listening practice showed audiences the power of closely noticing our voices as well as those around us.

Sound consists of vibrations in the air; it is a physical phenomenon that moves through our bodies. Music performance is often "live"— activated by muscles, bones and skin. One could make the claim that to overlook how music feels in the body is to disregard a parameter as important as harmony or rhythm. What surprising sounds can be discovered when a particular motion is applied, with discipline, to different surfaces? How closely does our sense of touch align with our visual and aural instincts?

This article discusses Judy Dunaway's balloon works as an exemplary model of a tactile approach to music-making. Her work focuses explicitly on something that most musicians and composers take as a given— the physical connection between body and instrument. This consideration of sensation is important to all stages of Dunaway's creative process, from conceptualization to actualization. She prioritizes intimate and direct contact with the sound object. Thus, touch becomes a compositional tool, performance technique, attitude of listening, and political statement— all at once.

By examining these implications of touch, Dunaway maintains a depth of practice that is unmatched among other practitioners of found objects. Balloons have a long history in contemporary music, and have been used by composers such as Mauricio Kagel, Anthony Braxton, and in Ricardo Arias' percussive "Balloon Kits."[3] Although Dunaway is not the first artist to give balloons a prominent role in art, she is well-known for her dedication and complete

3. Extensive discussion of the history of balloon in contemporary music can be found in Dunaway's article "My Beautiful Balloon: Part I."

mastery of it. And since the action of touch is not inherently musical, artists who work from this perspective tend to adopt a more multidisciplinary outlook. Dunaway's catalogue for the balloon is diverse both stylistically as well as in medium, ranging from solo and ensemble concert works to Fluxus-inspired events to interactive video art.

Judy Dunaway began her musical career as a guitarist and songwriter. Hailing from rural Mississippi, she soon became part of the vibrant Downtown scene in New York City after undergraduate studies at Hunter College. Between 1989 and 1995, she wrote and performed "art-rock" songs as part of the Judy Dunaway and the Evan Gallagher Little Band.[4] Since 1995, she has focused almost exclusively on the balloon as her creative medium. Dunaway later pursued graduate studies in composition and electronic music, studying with Alvin Lucier at Wesleyan University and at the Musikhochschule in Mannheim, Germany. She received a Ph.D. in Music Composition from the State University of New York at Stony Brook in 2007. Dunaway attributes her first use of balloons to Eugene Chadbourne's electric guitar preparations, beginning in the late 1980s. During his performances, he would rub small balloons and other objects on the guitar strings, using the pick-ups to amplify the friction between rubber and metal. The effect is spontaneous and free, though perhaps a little haphazard.[5] While initially following Chadbourne's idea, Dunaway soon began creating pieces for balloon sounds alone, works which convey a more deliberate and elegant aesthetic. Since then, Judy Dunaway has spent the past two decades creating as much art as possible with this object.

4. "JUDY DUNAWAYand the evan gallagher little band," 2000, http://www.jeweltone16.org/jdeglb/.

5. "EUGENE CHADBOURNE - #32 Pops Plays Pops," YouTube video, 4:28, from a live performance at The Stone, NYC on Aug. 17, 2007, posted by Robert O'Haire, March 27, 2008, https://youtu.be/LHHSUKoHBys.

I. Creating by Touch

" *In my work, the balloon and the body are one."*[6]

In the 1987 article "Instrumentalities," David Burrows explores the relationship between inanimate musical instruments and their human performers. In particular, he notes that instruments reflect the body's physical architecture. Our voices project because of hollow areas in our mouth and head, just as all acoustic instruments envelope a space that functions as a resonant cavity. He observes that, "like containers of all kinds they mimic the body, with its semi-enclosed interior spaces, and the sounds they make emerge like the voice from hidden recesses."[7] One can easily see this analogy when comparing the curves of a cello to shoulders and hips, or how a cylindrical bore of a clarinet mimics the windpipe in our throats.

The balloon is a pure container of air, conveying the idea that most musical instruments can be distilled as simply a resonant cavity. When inflated, it resembles not only our exterior shape, but also our internal organs. In fact, until Michael Faraday developed the first rubber balloon in 1824, balloons were made from animal body parts such as intestines or bladders.[8] A balloon's interior space is separated from the outside environment by only a thin layer of latex. Unlike traditional instruments, it does not feature intricate constructions such as frames, sound posts, or key mechanisms. Due to the physical properties of latex, its surface is flexible and unwaveringly uniform. By choosing the balloon as her instrument of choice, Dunaway's work investigates the most fundamental premise of Burrows' analogy.

---

6. Judy Dunaway, notes for *Balloon Music,* Judy Dunaway, Yasunao Tone, and Dan Evans-Farkas, CRI NWCR778, CD, 1998-2007.
7. David Burrows, "Instrumentalities," University of California Press, The Journal of Musicology 5, no. 1 (Winter 1987): 119.
8. "The History of Balloons," *Balloon HQ*, accessed May 9, 2016, http://www.balloonhq.com/faq/history.html.

The balloon's inherent potential as sound object is what primarily motivates Dunaway's practice. Its unique sounds directly correlate to the physical sensations of touching it. In the notes to her album *Balloon Music,* she writes of her initial attraction to the object in sonic, visual, and tactile terms:

> I liked the tremendous stretchiness that allowed an infinite prism of microtones. I liked that I could choose the color and size of my instruments, and that they had a sensual and appealing visual image. I liked that they were inexpensive, light and transportable…[9]

Her work with balloons is indeed a physical relationship— a human body activating the body-like instrument.

Unlike some instrument makers, Dunaway developed hers without forays into design or manufacturing—she works with the balloon "as-is," only aiming to reveal its sonic capabilities.[10] Over the years, Dunaway's balloon has undergone a process of what Andy Keep calls "instrumentalizing," an "exploratory process [that] seeks to create artistic statements that are responsive to the emerging sonic properties of an adopted or appropriated sounding object."[11] According to Keep, this process begins with "creative abuse" of the object in order to test the limits of its sounding abilities, followed by carefully assessing its playability, then developing "sound-shaping techniques" to control the sound. During this transformation from object to instrument, the musician relies on countless cycles of feedback from her aural, visual, and tactile senses in order to hone in on the most intriguing aspects of the chosen device.[12] In Dunaway's case, it is the sense of touch that yields the most influence on her process of instrumentalizing the balloon.

---

9. Dunaway, liner notes for *Balloon Music,* CRI NWCR778, 1998.

10. Dunaway orders her instruments from regular party supply stores as well as wholesale suppliers.

11. Andy Keep, "Instrumentalizing: Approaches to Improvising with Sounding Objects in Experimental Music," in *The Ashgate Research Companion to Experimental Music*, ed James Saunders, (Burlington: Ashgate Publishing, 2009), 113.

12. Burrows, 118.

Many objects are repurposed as musical instruments because they make interesting sounds during normal usage. For example, we notice the clear pitch of a crystal glass while accidentally hitting it with an eating utensil. This quality has since been fully exploited, and it is now practically a standard percussion instrument. However, the balloon only has one sound commonly associated with it: the pop. This is precisely the sound that Dunaway does not use in her performances[13], because it simply destroys her instrument.[14] The balloon also exists in the popular imagination as a silent visual object, but most importantly, as several sensations. First, there is the sensation of blowing up a balloon by expelling air through one's mouth. At the same time, hands supporting the balloon can feel the rubber's surface stretching. Once it is inflated, we can feel the way it bounces off of our hands as well as other surfaces. Thus, it is the tactile experience of balloons that contains the greatest variety of artistic manipulations and gives rise to its musical potential.

Judy Dunaway instrumentalizes the balloon by deriving performance gestures from the object's most salient tactile properties: buoyancy, pliability, and stretchiness. Although absolute pitch and rhythm is possible, a great majority of Dunaway's works take advantage of the balloon's built-in nuance. Handling a balloon naturally calls for fluid motion with the hands and arms due to its fragility and round shape. With one smooth surface and a single, undifferentiated air stream, there are no visual or physical markers for delineating parameters of its sound. Imagine playing a slide whistle with a flexible mouthpiece, or bowing a one-stringed instrument with no frets— except the entire string is a three-dimensional orb. So rather than modeling an existing instrument, Dunaway actually seeks the continuous flux that the balloon's physical properties necessitates. For her, such "'liabilities' can be turned into assets in the hands of an innovative

13. Dunaway has used the balloon pop exactly once, in the last track of her first album *Balloon Music*. In collaboration with Mark Howell, the 13-second piece is a stunning, time-stretched version of the stereotypical sound.

14. "Judy Dunaway: Manual Eardrums & The Globe," exhibition program notes, Interview of Judy Dunaway by Knut Remond, November 2013, Berlin-Neukoelln, December 8 and 15, 2013. http://www.jeweltone16.org/JudyDunaway/ohrenhoch_interview.html

composer."[15] All of Dunaway's playing techniques, discussed in the following section, emphasize continuity of movement. With this sensitive style, she is able to produce a huge diversity of sounds, from soft high squeaks to roaring drones.

The balloon's sound palette is generated by its modes of contact with the body, without mediation from any mechanism. In other words, the system is indexical: responsive on a one-to-one ratio.[16] For Dunaway, focusing on subtle sensations allowed her to develop expertise on the instrument:

> It was essential to be able to physically feel the vibrations, air pressure, and texture of the balloons. By using my hands, mouth, and body I could control tiny, sensitive manipulations that opened the door to greater possibilities for my instruments…[17]

In practice, however, the balloon still contains a high degree of unpredictability. According to Dunaway, its flexible latex molecules and spherical shape creates a distorted harmonic series and "infinitesimally microtonal" pitches.[18] Furthermore, these parameters depend on the amount of air used to inflate the balloon, something that Dunaway does not precisely measure out. She relies on the sensitivity and experience of her body in order to navigate the unique instrument that comes with each performance.

The balloon's direct, one-to-one method of sound production is offset by its unpredictability in performance. The tension between these opposing focuses explains two aspects of Dunaway's practice. First of all, many of her most iconic sounds are available to her own body only and not just a hypothetical one. Although her catalogue contains several ensemble pieces, Dunaway is most well-known as a solo performer of her own works. Although these solo works

---

15. Judy Dunaway, "My Beautiful Balloon, Part II: Orchestration and Playing Techniques for Balloons as Sound Producers," *Musicworks* 82 (Winter 2002): 42.
16. In his article Andy Keep describes the other end of the spectrum, the lack of indexicality in the knobs of an analog electronic instrument: "The fixed-scope dials and buttons inherent on a 'found' electronic instrument may not give any responsive mechanical,. Their manipulation can result in the sound becoming saturateed through gain or even degraded into complete collapse, but nothing in the feel of the controls would indicate this" (120).
17. Dunaway, "My Beautiful Balloon Part II," 41.
18. Ibid., 42.

are listed in her catalogue, these pieces are often not notated or published, and otherwise unavailable to the public because they were created for her specialized skills. For example, in Dunaway's works for tenor balloon[19], the amount of friction between hands and the balloon surface is critical to the resultant sound and is dependent on the texture of her skin (even with the aid of added water). More generally, she is the only known person with enough knowledge of the balloon's sounding nodes to manipulate the feature confidently.

Second, the balloon's unique responsive environment lends itself to improvisation. Maintaining a balance of control and spontaneity on the balloon lies at the heart of many of Dunaway's solo performances. In a video recording of her live improvisation in New York City's 109 Gallery in 2012, Dunaway systematically explores each sensation in order to create organic development throughout her 14-minute performance.[20] She begins by activating a very small surface area to produce small, high-pitched squeaks, then gradually begins to break the tone, forming almost a compound melody between the high notes and the lower ones. At 3:44, the increasingly steady speed of her hands evens out the pressure, and the sound reaches a unison that seems to move chromatically around a pitch center. About halfway through the performance, Dunaway begins to use heavy pressure to bring out the distorted, noise-based quality of the balloon. In addition to providing the balloon's sonic vocabulary, it is clear that touch informs and guides Dunaway's improvisational process.

Focusing on a haptic approach allows Dunaway to develop her instrument while avoiding reliance on its novelty and humorous connotations. Although it is a household object that is associated with childhood and celebrations, Dunaway's works for balloon rarely expounds on

19. *Molto for Tenor Balloon* (1999), *For Tenor Balloon and Voice* (2009), *Interactive Piece for Tenor Balloon and Player Piano II*, as well as the second movement of *For Balloon and String Quartet* (2001), from Dunaway's website catalogue, <http://www.jeweltone16.org/judydunaway/compositions.html>

20. "Judy Dunaway - Live at 109 Gallery NYC," YouTube video, with Judy Dunaway (balloon), from a performance at New York City's 109 Gallery on November 9, 2012, https://www.youtube.com/watch?v=0PJ9sAzYk78

such quotidian functions. Her practice challenges these assumptions, compelling audiences to wonder how such a mundane object can engender such complex sounds and meanings.

II. Touch as a Performance Practice

Just as we use our hands and breath to communicate with other humans and deal with the inanimate environment, playing an instrument engages more general human interactions. By transferring energy from an internal to and external world, instruments "comment on the relation of the performer's body and his or her living space."[21] In addition to this type of mediation, acoustic instruments also serve as extensions of the body. Musicians activate instruments through "acts of envelopment, wrapping their hands around them, their arms too or, in the case of a cello for example, much of the body."[22] Wind and brass instruments attach onto the oral cavity and translate breath into sound. The physical interfaces of instruments are designed for an intimate relationship, meant to be cradled, hugged, and breathed upon. On the simple interface of the balloon, this quality is especially pronounced.

Judy Dunaway's balloon performance practice prioritizes methods of direct contact. She physically surrounds her instrument, holding it between her knees, rubbing it with her hands, as well as feeding escaped air into the resonant cavity of her mouth. As an extension of her own body, the balloon is her primary vehicle for self-expression. Due to the sensitive and fragile membrane of the instrument, Dunaway controls the sound by noticing tiny variations of friction and vibration in her hands and mouth. She avoids more indirect methods of sound production, such as striking the balloon with a mallet. As one reviewer said of her first album *Balloon Music*, "Musicians so often speak of 'touch' in regard to tone; Dunaway seems to redefine that term" — in a literal sense.[23]

---

21. Burrows,117.
22. Ibid.
23. Kenneth Goldsmith, review for *Balloon Music,* New York Press, October 1998, http://wfmu.org/~kennyg/popular/reviews/dunaway.html

Dunaway has three main techniques for playing the balloon, using it as a reed, string, and resonator. Although the sonic world of balloons pits complex microtonal sounds against the Western classical tradition, her playing techniques mimic the physics of orchestral instruments, if not the sounds themselves. With this purposeful categorization, Dunaway makes a conscious decision to compare her balloon with common instruments. This makes the found object more relatable to classical musicians but also ironically legitimizes it as a "serious" instrument. In any case, Dunaway proudly advertises the balloon's versatility in its ability to disguise as many different types of instruments, including electronic ones:

> An inflated balloon has a resonant body like a classical guitar and vibrational nodes like a timpani. The mouth of the balloon functions like a woodwind reed or a brass player's lips. Rubbing the balloon yields sounds through a stick-and-slip mechanism similar to the bowing of a stringed instrument. Because rubber dampens its own overtones, the pure tones produced by the balloons are similar to those produced by an electronic oscillator. The oral inflection and enunciation into the mouth of the balloon are similar to that used by a singer.[24]

Each of the three playing methods occupies a separate sound world and expressive character. As an aerophone, the mouth of the balloon acts as a reed when air is gradually released from the cavity, creating a pinched timbre with continuous pitch control. This sound occurs as a long sustain that slowly slides and evolves, such as in the first movement of *For Balloon and String Quartet*. Frequently, Dunaway feeds the escaping airflow into the cavity of her mouth, using her body as resonator and modifying timbre by mouthing different vowels.[25] She also makes use of the reed-like opening of the balloon as an isolated mouthpiece, with the rest of the balloon cut away. This "cut balloon" technique has a similarly thin, pinched sound but is capable of song-like melodies that adhere to traditional rhythmic structures.[26] Her background as songwriter perhaps

---

24. Judy Dunaway, liner notes to *Mother of Balloon Music*, Innova 648, 2006, http://www.innova.mu/sites/www.innova.mu/files/liner-notes/648.htm

25. "Judy Dunaway: Reed Balloon Improvisation," YouTube video, 5:54, from a live performance at Logos in Gent, Belgium, 2002, uploaded by jeweltone16ONE on May 30, 2008.

26. Email correspondence with Judy Dunaway, February 15, 2017.

explains her style of melodic treatment within this technique. In her arrangement of Kurt Weill's "Surabaya" (accompanied by balloon sampler), the balloon "sings" the original melody in a humorously nonchalant character.[27] Here, Dunaway displays tremendous control of both reed-techniques, using the "cut balloon" technique during the first two verses and an inflated balloon in the last iteration of the verse, wailing in an extremely high range.

When used as an idiophone (the object itself as resonating body), the balloon acts like a bowed string or is stimulated to vibrate without physical contact. Dunaway rubs the surface of the balloon (most commonly her 16 inch "tenor" balloon) with her hands to create friction that vibrates the rest of the object. Within this technique, she compares the balloon to a violin string that is expanded into the shape of orb, whose overtone series can then be manipulated with friction. But because the flexible latex constantly mutates the series, the resulting sound is extremely noisy and complex: "When this sound is slowed through time-stretching one can hear how a pitch in the harmonic series can waiver [sic] as much as a whole step before it goes to the next harmonic."[28] With this string technique, Dunaway also holds the balloon between her knees and squeezes it to raise and lower the pitch— in this playing position, the instrument is completely enveloped by her body.

The final playing technique is the only one where the performer does not touch the instrument directly. Typically featuring the "bass" balloon (five to eight feet in diameter), Dunaway stimulates natural frequencies of the balloon with an outside force, such as the voice, pre-recorded sounds, or vibrators. The size of this instrument completely overwhelms the performer. In her performances, Dunaway sits behind this balloon and must hug it with her entire arm span in order to reach various nodes of vibration.[29]

---

27. "Surabaya" by Kurt Weill, arranged and recorded by Judy Dunaway with David Hanson in 1999. Unreleased recording from *UbuWeb: Sound*, http://www.ubu.com/sound/dunaway.html.

28. Dunaway, "My Beautiful Balloon Part II," 46.

29. Ibid., 41.

All of Dunaway's technical approaches to the balloon attempts to bring out its melodic and vocal capabilities. As mentioned before, her use of vibrato "warms" the sound into imitating an expressive human voice. The squeaks emanating from the balloon reed resemble humming in head voice or whistling. The rubbing technique results in groans much like those that humans emit in everyday life, while the drone of a vibrating bass balloon mimics a low male voice singing in a resonant space. Although it is an object that would typically be played by percussionists as an auxiliary sound effect, Dunaway's keen sense of touch properly analyzes the balloon's acoustics and avoids tapping or hitting it like a drum. Certainly, without a separate resonator, the balloon cannot function well as a membranophone; its percussive capabilities are limited to a "dull thud… only useful as a special effect."[30] In order to produce the most arresting sounds, her playing techniques require direct friction against a human body to produce the necessary resonance.

The technical parameters of balloon playing only convey a small part of the equation in musical performance. In evaluating Dunaway's practice, skill and interpretation are also essential components that set her far apart from amateur balloon enthusiasts. Once a musician has acquired or created an instrument, the next logical step is to develop performative skill. After gaining control of an object, one can acquire "operational skills, more decisive excitation and more subtle sound-shaping of timbral nuances."[31] It is the goal of any performing musician to acquire expertise on their instrument, and some even rise to the top as virtuosi by way of superior technical and interpretive ability. By general definition, a virtuoso possesses exceptional technical (physical) skill, executes difficulty with apparent ease, and pushes the art-form's expressive limits.[32]

---

30. "Jill Burton (voice), Judy Dunaway (balloon) and Jane Scarpantoni (cello)," YouTube video, 7:18, live improvisation at the COMA series at ABC No Rio, NYC on October 21, 2012, posted by "russl375101" on October 25, 2012, https://youtu.be/hawI5eDlyN4.

31. Keep, 125.

32. Owen Jander, "Virtuoso." *Grove Music Online*, Oxford University Press, accessed February 5, 2017, http://www.oxfordmusiconline.com/subscriber/article/grove/music/29502.

How does one attain virtuosic skill on an untraditional or newly-invented instrument? As a performer, Dunaway's expertise is clearly evident, yet it is difficult to measure by traditional standards. On one hand, she is the only known person to have invested such effort into these particular playing techniques and thus lacks a defined community of comparable balloon-colleagues. Accordingly, there is no standardized balloon repertoire with which one can use as benchmarks while advancing toward virtuosic skill. Dunaway herself is setting the standards as her art practice grows. When evaluating her virtuosity, one cannot (as of yet) rely heavily on comparison within the instrumental category itself.

The balloon also raises physical obstacles to normal means of assessing skill. Dunaway's playing techniques cannot convey virtuosity visually, as is possible when a pianist's fingers fly across the keys, for example. Each method of sound activation on the balloon consists of a single motion that controls several parameters at once. These gestures occur directly on the resonating surface without mediating objects, either with the hands or remotely, through vibrators. They cannot be observed and quantified through physical mechanisms, such as combinations of keys or the length or a string bow.

Yet the ability to create a wide range of expressive sounds is a traditional criteria for virtuosity on any instrument. Dunaway is clearly a virtuoso in this sense. Within each of the three principles of playing techniques (as string, reed, and resonator), she is capable extremely wide range of sounds, particularly with regard to pitch, articulation, and timbre. This is evident in performances where the balloon performs closely alongside a traditional instrument whose physical and expressive potential is more widely known. In her collaborative process with other musicians, Dunaway lays out specific sounds for them to imitate or respond to.[33] For example, in Etude No. 1 (2006), the violin begins by imitating the balloon's squeaks— violinist Tom Chiu's use of tremolo at the outset confirms the timbral distinction between the two instruments.

33. Email correspondence, February 15, 2017.

However, by 1:43, it becomes unclear which instrument is imitating the other, and at the two-minute mark, both are playing essentially in unison with oscillating glissandi.[34] In *For Tenor Balloon and Voice* (2009), Dunaway is able to echo the attacks of Jennifer Walshe's guttural throat sounds (or vice versa) with uncanny precision.[35]

Dunaway's unconventional virtuosity, combined with an open sense of musicality, aligns her work squarely with the Downtown aesthetic. Kyle Gann, longtime critic for *The Village Voice*, defines Downtown music as being decidedly inclusive: "There were standards, and pieces that failed or succeeded according to their own inherent principles, but there were no rules, no formulas for success, no prohibitions, no justifying precedents."[36] It is an aesthetic cuts directly against the teleological order of European classical music. Thus, a successful performance for Dunaway is not fulfilled through correct notes or diminished by accidental deviations from a score. Rather, the emphasis is on the manipulating the quality of sound, such as creating tension with a subtly morphing drone or acoustically filtering a minute-long squeak. Although traditional structures of pitch and rhythms are possible, the balloon's novel and diverse sounds warrant an interpretive approach that patiently reveals the object's natural qualities.

34. "Etude No. 1," with Judy Dunaway (balloon) and Tom Chiu (violin), on *Mother of Balloon Music,* Innova 648, 2006.

35. "For Tenor Balloon and Voice," streamed audio, uploaded by light-23, https://soundcloud.com/light-23/for-tenor-balloon-and-voice

36. Kyle Gann, Preface to *Music Downtown: writings form the Village Voice,* (Berkeley: University of California Press, 2010), xvii.

III. Notation of Touch

Composers working within the Downtown scene and other experimental traditions tend not to revere written scores. Since their music tries to capture the immediacy of a moment, it might not be necessary for anything to be written down at all. If scores are made, they are typically a set of basic instructions around which performers can improvise and express themselves. Scores created by such experimental composers might even critique the process of writing music itself. Michael Pisaro's discussion of John Cage's *Solo for Piano* touches upon this unique relationship between experimental music and notation: "What is desired is a situation flexible enough to take on all of the minute inflections in sound… to give impetus to the becoming of sound…to be in a situation where one does not know when one is directing and when one is being directed."[37]

The prevalent view in Western classical music is that performance should recreate the composer's vision that was conceived at a certain time. In other words, since the music is faithfully represented in the notation, performers must render it precisely in order to convey the work. Dunaway's diverse output for balloons takes both perspectives, albeit unevenly. Most of her works cannot be easily traced back to any written material, and some exist only as live recordings of one-time improvisation sessions. In those situations, the experience of the sound itself takes primacy, and her attitude toward notation is very much of the Downtown, experimental milieu. With other pieces, Dunaway takes on the role of a more traditional concert composer, using notation to create a complete and detailed written representation of a sonic event. She has developed notational systems specific to balloon playing and has several scores officially published by Material Press, which may be purchased and performed by the general musical public.

How does one notate a sound that is primarily noise-based, unpredictably microtonal, and activated by the texture of fingerprints and invisible vibrations? And if one takes the prescriptive

37. Michael Pisaro, "Writing, Music," in *The Ashgate Research Companion to Experimental Music*, ed. James Saunders, (Burlington: Ashgate Publishing, 2009), 31.

route rather than a descriptive one, the question might be: how can one represent the sensations of friction and air pressure in a written form? The tactile aspects of both the balloon's technique and sound is impossible to notate with conventional notes and rhythms on a five-line staff. Instead, Judy Dunaway has adopted common textual and graphic methods of notation while inventing her own symbolic nomenclature.

A subset of Dunaway's scores are conceived for a typical performer's limited skills on the balloon. As such, they consist primarily of text describing playing techniques and how the piece should be performed. This prose also describes the resultant sonic effect, but often to a lesser extent. Although this approach leaves out many of the usual details provided by conventional notation such as dynamics and phrasing, it allows wider possibilities for individual expression. In fact, extremely complex patterns can emerge out of simple asynchrony. In the best textual scores, "apparently simple activities… generate…a host of layered, sometimes personally transforming moments of sonic awareness."[38]

Several of Dunaway's works are open to any number of players at any skill level. *The Sound of Skin* (2003), in particular, is described as "sound-focused work written in the style of a Fluxus event score."[39] The single-page score is listed almost like a recipe, with "Ingredients" (balloons, water, and skin) followed by "Instructions" for putting the piece together. It asks for participants to rub the balloons on their skin in various ways, "firmly, lightly, quickly, slowly, with varying amounts of water."[40] The expressive content of piece lies in the sounds of balloons touching and interacting with different parts of the body, which is further determined by the different skin textures of the participants. The actual sensation of the process cannot be put into words, and the resultant sound is intentionally unpredictable and chaotic. Thus, Dunaway's notation simply

38. Pisaro, 52.

39. "The Sound of Skin - a Fluxus score by Judy Dunaway." YouTube video, from a performance by The Kattt Sammon Ensemble at ACME Observatory, San Francisco, California, December 2003, uploaded by jeweltone16ONE on March 27, 2014, https://www.youtube.com/watch?v=xZ_Q5R-1_w4

40. Judy Dunaway, *The Sound of Skin*, (Frankfurt: Material Press, 2003).

describes what must be done. An audience member experiencing the piece would be affected not just intellectually, but also viscerally. On top of the complex sounds and sights of people seemingly bathing each other with balloons, one would empathically imagine how the latex balloons feel as they pull and rub on the skin. *Balloon Symphony No. 2* (2004) creates a similar atmosphere, but in this case the audience and participants are one and the same. The score also consists solely of text, and uses two video projections in order to communicate instructions to an even larger group of participants.[41]

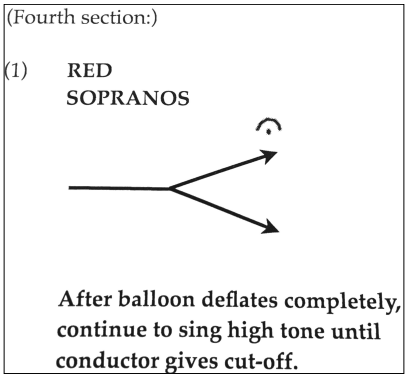
For Chorus with Balloons (1999) is much more structurally composed than the previous examples, yet is still primarily text-based. The score contains extensive and very specific instructions on materials and logistics, as well as how to perform using the reed technique. Unlike the Fluxus-inspired pieces, *For Chorus with Balloons* illustrates Dunaway attempting to lead a group of people through her artistic vision, rather than simply allowing them to freely explore sounds. Outside of the written instructions, the performers actually encounter the "music" as a series of colored cue cards to be made and held up by the conductor. Figure 1 shows the last directions for the sopranos (who all have red balloons at the start of the fourth section). The split arrow represents both balloon and voice beginning at near-unison, then diverging, with the voice ascending in pitch and balloon descending. At the onset of the unison, Dunaway advises the chorus to notice the vibrations of beating. The only traditional notation element used in the whole piece is the final fermata.[42]

Despite an unwieldy amount of text, Dunaway's instructions in *For Chorus with Balloons* are thorough and should ensure successful performances. However, the written material does not do justice to the actual experience of the piece for both performers and audiences. Brightly colored balloons might imply playful musical material, but the sonic result is powerful and

41. "Judy Dunaway - Works for Balloons (overview)," YouTube video, at 2:41, posted by russl375101 on March 2, 2014, https://www.youtube.com/watch?v=zL5h4I47szQ

42. Judy Dunaway, *For Chorus with Balloons,* (Frankfurt: Material Press, 1999), 13.

Figure 1



haunting— like a hundred air sirens sounding in slow motion, approaching the epic glissandi of Xenakis' writing for strings.[43]

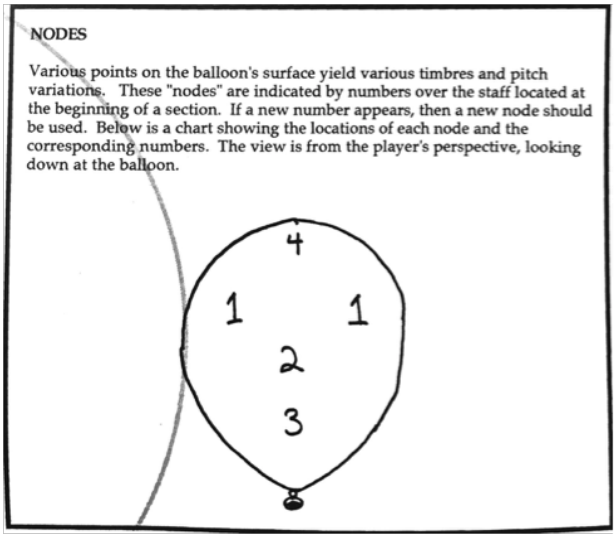
For pieces requiring advanced skill, Dunaway has developed a more specialized notation system that attempts to convey the performer's physical gestures. These methods are detailed in her article "My Beautiful Balloon: Part II" in the Winter 2002 issue of Musicworks magazine. The string technique of rubbing the balloon, in particular, calls for a combination of images and invented symbols. A legend depicting the surface of the tenor balloon uses numbers to represent various harmonic nodes on the balloon. Playing on each of these four nodes will change the timbre and pitch of the sound (Figure 2). Other physical parameters, such as direction of hand movement, amount of hand pressure, as well as continuous or broken pitch content are notated with special symbols. For these, Dunaway keeps the traditional note and stem but modifies the tail— using swirls to convey circular motion and arrows to indicate the direction of movement relative to the body (Figure 3).[44] In an excerpt from *Molto* for tenor balloon (Figure 4), Dunaway also adds an addition parameter— hand pressure, differentiated as high (H), medium (M), or low (L).[45] For example, in the first note, she asks for medium-high hand pressure on a

43. "For Chorus with Balloons," Unreleased recording from UbuWeb: Sound, http://www.ubu.com/sound/dunaway.html. There is also video performance of Dunaway conducting the Wesleyan Singers at https://www.youtube.com/watch?v=nV3iuS-tOYI.

44. Dunaway, "My Beautiful Balloon Part II," 45.

45. Torsten Mueller, Kunsu Shim and Gerhard Staebler, *SoundVisions*, (PFAU Verlag, Saarbruecken: 2005), 79.

Figure 2



straight rub with both hands moving in opposite directions. The sound there should be broken, that is, sweeping through a variety of harmonics within the single hand gesture.

For Balloon and String Quartet (2004) is written for Dunaway herself performing with the Flux Quartet. In the score, her special symbols for the balloon are combined with regular staff notation in the string parts (Figure 5).[46] In the first movement of this piece, Dunaway takes an opposite notational approach with the reed technique than she did in *For Chorus with Balloons.* Rather than describing *how* to release air from the balloon, she simply indicates the actual sounding pitches that move in counterpoint with the strings, taking advantage of her own virtuosic skill. In the third movement, she has opted to leave the balloon staff completely empty while she activates the bass balloon as an ongoing drone. For this piece, Dunaway's balloon notation simply serves a practical function for herself in performance or rehearsals, rather than the traditional aim of creating a score for anyone to interpret or study.

Dunaway's various notation methods are reasonable reactions to the unique features of her instrument. Noise-based sounds and tiny sensations cannot be written down in an easily readable system, and Dunaway has found acceptable, if imperfect, solutions to describe how to

46. Judy Dunaway, *For Balloon and String Quartet*, score excerpt, courtesy of the composer.

Figure 3

RUBBING TECHNIQUES

Two-handed parallel rubs - Use both hands rubbing in the same pattern (circular or straight). For circular rubs, one hand should go clockwise and the other counterclockwise. For straight rubs, one hand should go away from the body, and the other should come toward the body, at the same time. All techniques are two-handed parallel, unless otherwise indicated.

Circular rub - Rubbing the balloon in small circular patterns (appx. 5 inch circumference). The swirled tail indicates a full circle of the hands for each note value. Indicated by the following symbol:

Straight rub - Rubbing the balloon in a straight line, either toward the players body or away from the players body. The arrow indicates the direction of the rub. Indicated by the following symbol:

 (away from body)

 (toward body)

Counterhand straight rubs - Rubbing the balloon with one hand going away from the body and the other hand coming toward the body, at the same time. Indicated by the following symbol:

Unbroken - Straight or circular rub that maintains a somewhat steady pitch and stays in the same specified "range." Notes are assumed to be unbroken, unless they are otherwise marked.

Broken - Straight or circular rub that gives an arpeggiated group of harmonics. Usually uses more than one "range." A line across the note will indicate a broken tone:

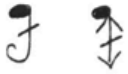


Figure 4

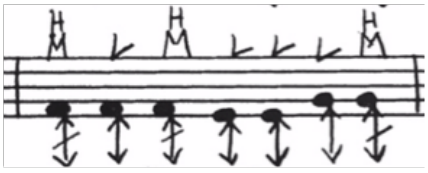
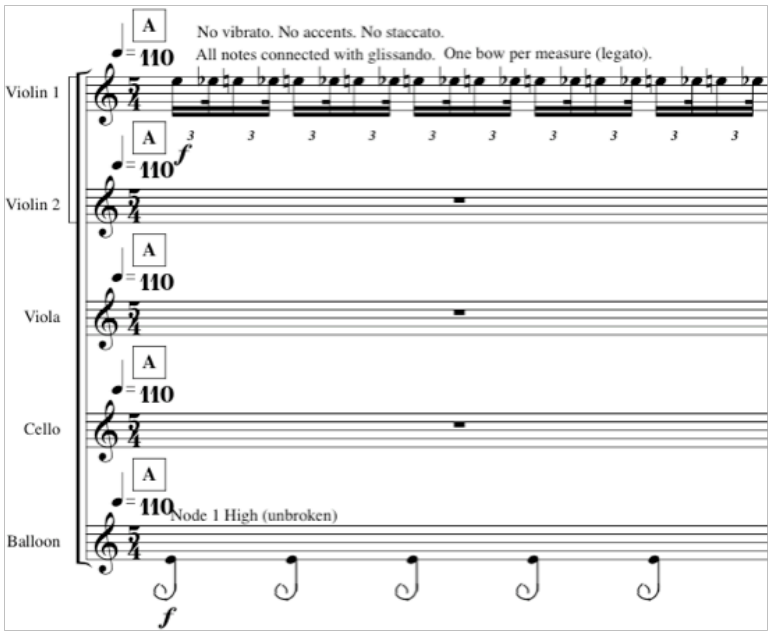


Figure 5



recreate them. My own attempt to notate Dunaway's performance of *For Giant Balloon and So* (discussed in more detail later) further illustrates the limits of notation for this music. I transcribed the 8-minute drone with both descriptive and prescriptive approaches— describing the sound with traditional notation (Figure 6) and explaining the physical gestures with text (Figure 7). Although these "scores" might be acceptable and technically accurate, both versions reveal very little about the actual music. As with *For Chorus with Balloons*, even the best notational solutions cannot accurate represent the actual complexity and nuance of the sounds.

Figure 6

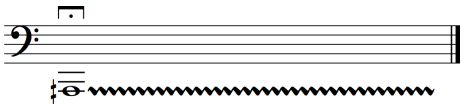


Figure 7

With one vibrator in each hand, activate the resonance of giant balloon by holding them close to the surface. Move arms symmetrically in large circles very very slowly, over a duration of about eight minutes.

Dunaway's professional practice surrounding these written materials raises issues about artistic identity and ownership. The only pieces that Dunaway makes available to the general

public are the four published scores, which represent only a small portion of her current list of works.[47] These works demonstrate a wide stylistic breadth, ranging from *On the Air,* a traditionally-notated piece for saxophone and fixed-media, to *For Bass Koto with Balloons,* a game piece that uses elements of chance as dictated by playing cards. Unfortunately, some of these works seem more like inconsequential forays into various techniques rather than fully-conceived artistic visions. They also contain basic editing and notational mistakes that are unusual in professional scores.[48] With the exception of *For Chorus with Balloons,* these scores, both structurally and sonically, do not stand up to the improvisational brilliance of Dunaway's performances— which are often also labeled as compositions.

While there is obvious fluidity between the activities of composing and improvising— composers usually come up with ideas through improvisation— they are also diametrically opposed. Expectations of a piece or performance change depending on which approach audiences perceive is the intent of the author. Composing (in the traditional sense that results in published scores) allows for structural sophistication not available to real-time improvisation; listeners expect formal cohesion and a conscious treatment of musical details. On the other hand, the understanding that an improvisation is largely unplanned forgives certain errors of continuity, and also makes moments of brilliance all the more special. By frequently conflating the two in her practice, the spontaneity of Dunaway's improvisations could be taken as compositional weaknesses, while the technical problems of the published scores make her overall output seem inconsistent. In rare cases, this ambiguity can produce astonishing results, as in the case of the "composition/improvisational structure" that Dunaway created with vocalist Jennifer Walshe.

In light of this, it is unfortunate that Dunaway's most ground-breaking work is largely limited to her own performances and recordings. While many of her balloon pieces do feature

47. Lists works between 1990 and 2014. Dunaway, "Selected Compositions", http://www.jeweltone16.org/judydunaway/compositions.html, accessed March 25, 2017.

48. For example, *On the Air* questionably uses key signatures in contexts that are either not in the given key or generally non-tonal; there are also many engraving collisions along with strange rhythmic groupings.

collaborators, her own involvement as a performer is also imperative. For instance, *For Balloon and String Quartet* cannot be acquired by another string quartet. The piece exists solely as the recording released on the Innova label and as a work that only Dunaway herself can potentially perform again. This is problematic, as it is posited as a concert piece by someone who has been known to publish scores for wider dissemination. In her valiant pursuit of many creative personas — "composer, free improvisor, conceptual sound artist, transmission artist[,] and creator of sound installations"[49] — these roles can sometimes contradict and work against each other.

It is natural for Dunaway to want to protect her unique work from imitators, especially ones who might misunderstand her intentions. Throughout history, there are many examples of the secretive virtuoso. Paganini was famously tightlipped about his practice regimen, and Louis Armstrong covered his hands with a handkerchief to hide his fingering choices. But could new musicians learn Dunaway's techniques and subsequently advance the field of balloon playing if written documentation of her virtuosic works were made available? Perhaps balloon performance practice requires a uniquely 21st-century distribution platform, with the growing series of online videos that Dunaway posts on YouTube. The issue of dissemination is made even more sensitive due to the balloon's humorous connotations. Not wanting to risk mediocre performances or ones that poke fun at the instrument, Dunaway restricts both access to the some of her music and the expressive markings within them. In *For Chorus with Balloons* and *Sound of Skin*, respectively, she asks performers to avoid "crescendo, decrescendo, accents or other interpretive dynamic techniques" and "affected interpretations." While Dunaway does not aim to control audience reactions toward her instrument, she is adamant about the non-comedic intent of her work and the musicians' responsibility to convey that. How can a composer successfully negotiate between protecting their work's integrity and potentially alienating audiences?

49. Taken from Dunaway's personal website, http://www.jeweltone16.org/judydunaway/biography.html, accessed March 25, 2017.

IV. Listening through Touch

The rift between sensation and the notation seems impossible to overcome. As long as we are encased in our own individual bodies, musicians must rely on other tools— such as visual demonstration, language, and images— in order to convey a tactile mode of expression. Although this causes problems from a compositional standpoint, notation is simply one step toward the ultimate goal of listening. When touch informs both the creation and performance of a musical practice, audiences react to the sonic results accordingly, with a heightened awareness of their bodies. This approach opens up "the listening point from the ears to the tissues of the body—a tangle of information, memories, and physical and psychic relationships."[50] Judy Dunaway's own performances encourage this way of "full-bodied listening" through audience empathy, while her sound installation *Manual Eardrums* makes the process literal and experiential.

Audiences subconsciously identify the balloon's sounding features with processes happening in their own bodies. This natural empathy allows for an augmented way of listening to musical sound. As friction is created with the string/rubbing technique, the microscopic snapping back of the balloon's latex skin has a visceral impact that does not occur with traditional instruments. In this case, the contact point is not horsehair against metal strings, or lips against a reed, but an extremely intimate situation of skin against skin (even if one of those is artificial). When watching or listening to Dunaway's reed technique, my throat instinctively tenses at the sound of the extremely thin column of escaping air. The resonant drone of a giant weather balloon would certainly fill a room with vibrations, and makes me think of the feeling of having a rumbling stomach. After many minutes, audiences might no longer actively perceive the pitch of the drone, and simply feel the sound.

Instead of presenting a narrative, many of Dunaway's works strives to create a sense of space. Often, her balloon performances require "virtuoso listening," which "has a primary focus

50. Gascia Ouzounian, "Embodied sound: Aural architectures and the body," *Contemporary Music Review* 2006, 25:1-2, 70

on…the sonic qualities of mass, grain, spectral content and dynamic envelope."[51] In a context that features ambient rather than rhetorical material, these micro-components of sound become of primary interest to the listener. Dunaway's audiences are treated to an immersive landscape where drama is measured through timbral changes rather than narrative or motivic dialogue.[52] Thus, in addition to transferring listening capacities to other areas of the body, this physical approach to music-making slightly shifts the focus on what audiences should listen for.

In *For Giant Balloon and So*, the balloon and automated sousaphone interact in a positive feedback loop, reinforcing each other's drones and vibrations.[53] Over the course of Dunaway's eight-minute performance, listeners can simultaneously perceive one consistent drone as well as the infinite variety of details within the sound. In addition to constantly changing speeds of beating, the pitch also bends slightly as Dunaway's arms move around the large sphere. There are moments where she seems to control the spectral content of the sound: at 2:35, when a pure fundamental sounds without extra buzz, and at 3:41, when the 5th and 6th partials are clearly present. By isolating different parts of this sound, Dunaway reminds the audience that there is much more behind its static surface and guides them towards an appreciation of the complex soundscape.

Dunaway's installation Manual Eardrums (2002) distills the concept of listening through touch to its basic essence. Her impetus for the work was to reach beyond audience empathy, to create "something that was more sensual than merely listening to the tone in the space," so that "the listener feels the room, they don't just hear it."[54] The work features large speakers that play a very low frequency, slowly sweeping between 100 to 150 Hz in an enclosed space. Participants are

---

51. Keep, 117.

52. Brian Eno, forward to *The Ambient Century* by Mark Prendergast, (London: Bloomsbury, 2000), xi.

53. The So instrument was built by Godfried-Willem Raes, subsequently automated by Dunaway using MaxMSP. "For Giant Balloon and So - Judy Dunaway." YouTube video, uploaded by jeweltone16ONE on Dec. 23, 2014, accessed Feb. 17, 2017, https://www.youtube.com/watch?v=v5Ruq6Csiro

54. Knut Remond, interview

given inflated balloons to hold as they walk around the space.[55] Vibrations of sound are thus transmitted to the participant's hands by way of the delicate balloon surface— allowing one to literally hear through tactile means. As the sound changes, one can map their physical surroundings through the varying intensities of vibrations. Audiences are encouraged to use earplugs while they are in the space, further dulling their ears and heightening their sense of touch. Even though the actual sounds in the piece are quite static, this transferral of sound from the ears to the hands is a profound act, requiring listeners to "turn their sonic gaze inwards, and in the process re-imagine their bodies as sites within which sounds can resonate, rather than as neutral, unengaged receivers."[56] Awareness of the physicality of sound allows for a deeper, more active way of listening.

The conceptual basis behind *Manual Eardrums* can be traced back to several established figures in the experimental tradition of the twentieth century— certainly John Cage, but more specifically in the works of artist Bernhard Leitner, composer Pauline Oliveros, and Dunaway's own mentor Alvin Lucier.[57] For context, these artists' key ideas will be discussed briefly.

Like *Manual Eardrums*, Bernhard Leitner's austere sound installations invites the audience members to feel sound with their bodies. In his series of *Sound Chairs* (1974-), loud speakers playing basic tones are positioned around and under specially designed reclining chairs.[58] Leitner challenges the listener to open their perception to his own realization, stating, "I do not hear only with the ears but with the entire body. It is quite possible to hear a sound that oscillates under my soles, so to speak, to experience and hear it acoustically… I hear and experience it when it arches over my head as an immaterial arch, so the skullcap listens as well."[59]

---

55. "Judy Dunaway installation at ohrenhoch sound gallery," YouTube video, from a visit to the Ohrenhoch Sound Gallery, Berlin, December 2013, uploaded by russl375101 on February 16, 2016, https://youtu.be/tqoUNXQdRw8

56. Ouzounian, 73.

57. For John Cage's perspective on listening and focus, see Michael Nyman, *Experimental Music,* p. 24-26.

58. Atelier Leitner, "SOUND CHAIR (Deck Chair)," http://www.bernhardleitner.at/works

59. "Bernhard Leitner & Sound-Space-Sculpture," Vimeo video, uploaded by KA21 / CastYourArt on March 6, 2016, https://vimeo.com/157713877

In her classic *Sonic Meditations* (1971), Pauline Oliveros was similarly focused on listening through the body. Rather than building structures to house and contain these experiences as Leitner did, Oliveros believes that one can undergo such transformations from the inside out, through mental focus. In *Sonic Meditations,* a set of twenty-five small, text-based scores, simple yet deliberate activities are centered around silence, breathing, and vocal production. The communal quality of Dunaway's Fluxus-inspired works echoes the Oliveros' view that "the music relates to the people who make it through participation and sharing."[60] These exercises use basic body movements to broaden the act of listening, such as suggested in the fifth meditation, "Native": "Take a walk at night. Walk so silently that the bottoms of your feet become ears."[61] In addition, Oliveros' Deep Listening Institute continues her unique philosophies on listening and spiritual healing.

Judy Dunaway's work is deeply influenced by Alvin Lucier, particularly in the pursuit of the sonic "signatures" of objects and environments. In her 2013 interview with Knut Remond, Dunaway mentions Lucier's ideas as having the most impact on *Manual Eardrums,* and also points to a similar use of a sweeping oscillator in his 1984 work *In Memoriam Jon Higgins*.[62] Her persistent focus on revealing the balloon's sonic personality, as well as the visual presentation of her performances, can be attributed to the sparse and distilled aesthetic of her mentor. In *Music for Solo Performer* (1965), Lucier reaches beyond bodily gestures to utilize electrical current that exists deep inside the body. The alpha rhythms of his brain are detected with electrodes and amplified, thus using his own body as the musical instrument as well as a platform for experimentation.[63] These sounds in turn are used to resonate percussion instruments and other found objects, just as how the low oscillator activates balloons in Dunaway's installation. In addition to regular vibrations, both composers are concerned with harmonic beating. As the

60. Pauline Oliveros, *Sonic Meditations,* Smith Publications, 1974.
61. Ibid.
62. Knut Remond, interview.
63. Nyman, 106.

frequencies of the clarinet and oscillator in *In Memoriam Jon Higgins* gradually move toward and away from one another, the distinctive sound of beating occurs.[64] Such interference patterns often a main subject of Dunaway's bass balloon playing, where two vibrators beat against each other while stimulating the latex surface. Yet, as she has stated, her work makes this phenomenon directly accessible by incorporating touch as an essential element.

Dunaway's sensitive treatment of tactile aspects in her balloon work invites listeners to feel the music, whether vicariously or literally. Recently, she has begun to integrating the visual senses as well, using the balloon as a (literal) blank canvas for accessing multimedia and connections with other artists. In *Hommage à Kenneth Noland* (2015), the tenor balloon doubles as a projector for video art that responds to the frequency and amplitude of her performance sounds in real-time, providing a truly multi-sensory experience for audiences.[65]

64. "Alvin Lucier - In Memoriam Jon Higgins (Liam Hockley, Clarinet)," YouTube video, uploaded by Liam Hockley on Aug. 17, 2013, https://www.youtube.com/watch?v=syEHDViGFa8

65. "Judy Dunaway: Hommage à Kenneth Noland," YouTube video, from a performance at Spectrum, New York City in September 2016, uploaded by jeweltone16ONE on Oct. 25, 2015, https://www.youtube.com/watch?v=ed3UV7_JThc

V. Touch as Political Statement

In the 1960s, Pauline Oliveros found herself surrounded by political turmoil resulting from the aftermath of John F. Kennedy's assassination and the vehement protests against the Vietnam war. Through the gradual development of her Deep Listening practice, Oliveros found a setting for activism. The ♀ Ensemble, an all-female group founded by Oliveros, worked to advocate listening, thoughtful action, and to release societal expectations of the female body.[66] Just as her *Sonic Meditations* served as an activist platform for second-wave feminism, Dunaway's feminist angle comes directly out of the political concerns of her time, particularly the early 1990s, when her balloon practice first began. Her work addresses the AIDS crisis and the post-colonial concerns of third-wave feminism, while also embracing many ideas of cyberfeminism. Uniting the nuances of these different viewpoints is an unwavering focus on "body-centered politics," where the physical body is a site for subversion against oppression.

The rubber latex that makes up modern balloons contains great significance for Dunaway. She says that during 1990s, balloons became "a significant tool of artistic expression for me… because of the association between latex and AIDS prevention. I lost many friends to AIDS and saw latex as a material that allowed both sexual freedom and survival."[67] In addition to this personal connection, her instrument also references the historical oppression of the rubber industry and becomes a conduit for exploited bodies: "the balloon is made of the 'blood' of the Amazon's rubber tree and filled with human breath."[68] Her collaboration with Damian Catera, *The Rubber Forest* (2004-6), relates to this subject directly. She has also spoken of the balloon's sounds as vocal "cries" that reacts to the brutality of the indigenous rubber farms and the

66. Kerry O'Brien, "Listening as Acitvism: The "Sonic Meditations" of Pauline Oliveros," *The New Yorker*, December 9, 2016.

67. Dunaway, liner notes for *Balloon Music.*

68. Ibid.

destruction of the rainforest.[69] In this way, the sac-like enclosure of a balloon becomes personified as a politicized human form.

The tactile quality of Dunaway's performance gestures, as discussed in previous sections, is also unapologetically sensual. Her reed technique, which draws attention to the mouth and parted lips, is full of sexual innuendo. The rubbing motion required of the string technique on tenor balloon alludes unquestionably to masturbatory gestures, as the instrument is held between the knees. It is no accident that her resonance-activator of choice is the vibrator, which is an obvious symbol for female sexual freedom. Dunaway holds no qualms about these associations, motivated through political urgency to express this sensuality: "In an era where the progress toward a woman's control of her own body is threatened, I have coupled myself to a musical instrument that expresses sensuality, sexuality and humanity without inhibition."[70] Her performance style is "indelibly stamped" by cellist Charlotte Moorman, who in the 1960s broached provocative subjects using mundane household objects, all the while performing with utmost professionalism and seriousness.[71]

In addition to these specific material and gestural connections, the balloon also functions as a more general symbolic carrier of Dunaway's feminist views. The instrument's circular shape contains universal references to the eternal and the divine female— particularly the womb and its generation of life.[72] The smooth surface and hollow of the balloon certainly reinforces this connection. Dunaway's holistic treatment of the balloon, with minimal preparations and tools, further points to a concern with preserving the circular imagery of her practice. In fact, the video images that she developed for *Hommage à Kenneth Noland* are based entirely on Noland's work

---

69. Adam Phillips, "Avant-Garde Music for Toys, 'Playing' in New York," audio recording, VOICE OF AMERICA, April 1, 2009, http://www.audiobyadam.com/2009/new-serious-music-for-toys/

70. Dunaway, liner notes for *Mother of Balloon Music.*

71. Knut Remond, interview.

72. The circle also indicates female in modern pedigree charts. This lies in direct contrast to the square, "linked to man and his constructions, to architecture, harmonious structures, writing…" from Bruno Munari, *Square Circle Triangle*, (New York, Princeton Architectural Press), 99.

with concentric circles, and not the chevron shape or horizontal stripes that the artist is also known for.[73]

Judy Dunaway's particular feminist stance and interest in technology shows a conspicuous connection to the cyberfeminist movement of the early 1990s. Cyberfeminism was a political art movement which sought female empowerment within the burgeoning technological space of the internet. Inspired by Donna Haraway's essay "A Cyborg Manifesto" (1985), the term was coined in 1991 by British cultural theorist Sadie Plant. That same year, the VNS Matrix, an Australian art collective comprised of Josephine Starrs, Julianne Pierce, Francesca da Rimini, and Virginia Baratt, created "A Cyberfeminist Manifesto for the 21st Century." The text, written in a stream-of-consciousness style, touts female sexuality as a way to dismantle the patriarchy (the "big daddy mainframe"). This manifesto, along with the VNS Matrix's repertory of video games, installations, and billboards, echoes the "collaborative, plagiaristic, possibly drug-fueled, and pornographic" atmosphere of the early internet.[74] While the cyberfeminists did not have a cohesive agenda, the art that was created within this vein of thought was inclusive of different feminisms and "subversively questioned discourses of domination and control in the expanding cyber space."[75]

This movement's influence on Dunaway is particularly clear in her telematic and transmission works (which could be expounded on in another study, as they often do not involve balloons). Telematic art-work creates shared experiences by way of remote communications and broadcasts, whether through radio, phone lines, or the internet.[76] Dunaway's SWIRL (Sex Workers' Internet Radio Lounge/Library) project brings the voices of sex workers to a common location in cyberspace, giving this marginalized group of women a platform for expression. In

---

73. "Selected Works: 1960-70," The Official Website of Kenneth Noland, http://www.kennethnoland.com/works/1960-1970.php

74. "A Cyberfeminist Manifesto for the 21st Century", from *Net Art Anthology*, presented by Rhizome, accessed Feb. 17, 2017. https://anthology.rhizome.org/a-cyber-feminist-manifesto-for-the-21st-century.

75. Virginia Barratt, Julianne Pierce, Francesca da Rimini, and Josephine Starrs, "VNS Matrix: Selected Curriculum vitae," 2015.

76. Christiane Paul, *Digital Art,* 2nd Edition, (London: Thames & Hudson, 2008), 153-4.

addition, her *Duo for Radio Stations* (1992) and *What You Cannot Hear* (2011) are performed through the radio and internet, respectively.[77] Still, the particulars of Dunaway balloon practice fulfills many cyberfeminist objectives. Her solo and collaborative performances raise awareness of the physical aspects and resultant politics of the female body. The use of vibrators and rather sexual gestures in her playing techniques also demonstrates sexual empowerment as a key aim.

One of the most the most striking links between cyberfeminism and Dunaway's balloons is in the visual imagery. The circle/sphere is featured prominently in the most recognizable and provocative images of the cyberfeminists. The Cyberfeminist Manifesto (Figure 8) is inseparable from its visual setting within the glowing orb, which looks exactly like one of Dunaway's giant balloons. One can certainly agree that much of Dunaway's work "ruptur[es] the symbolic from within."[78] A screenshot taken from the VNS Matrix video game *All New Gen* features three "DNA Sluts," female characters whose superpowers come from their genitals (Figure 9)[79]. This explicit empowerment of the female body is perhaps a little over the top, but one cannot help but notice the similarity between the center figure with the large green oval and Dunaway holding her tenor balloon in performance . Both figures boldly express themselves through (sexualized) physical contact—Dunaway, in a musical way, and the video game character, a weaponized one.

An important aspect that distinguishes cyberfeminism from general second or third-wave feminism is the use of playful exploration to convey serious messages. In addition to the *All New Gen* video game, there is Linda Dement's CD-ROM exhibition "Cyberflesh Girlmonster" (1995), as well as countless web-based multimedia artworks imagining a utopian

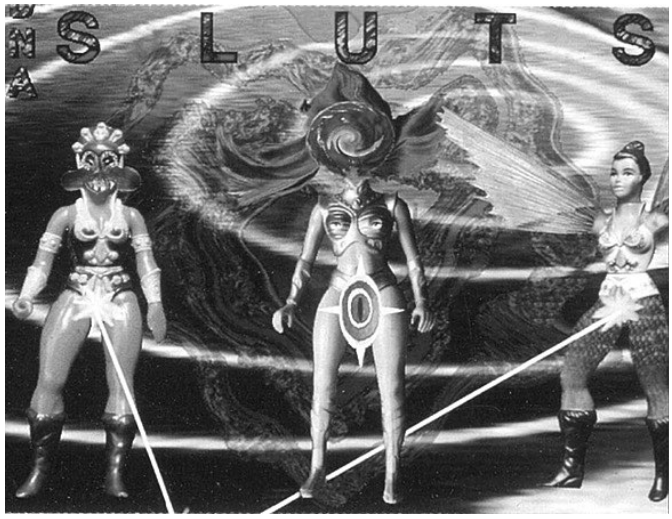
77. Judy Dunaway, "Selected Compositions," http://www.jeweltone16.org/judydunaway/compositions.html, 2008

78. *Cyberfemnist Manifesto for the 21st Century*, from "'We Are the Future Cunt': CyberFeminism in the 90s" by Claire L. Evans, *Motherboard*, Nov. 20, 2014, accessed May 5, 2016, http://motherboard.vice.com/read/we-are-the-future-cunt-cyberfeminism-in-the-90s.

79. Ibid.

Figure 8

Figure 9



world outside of the patriarchy.[80] In the "100 antitheses" from the first Cyberfeminism Congress, the 83rd item refers to engaging in play as means to defy the current male-dominated order: "cyberfeminism is not about boring toys for boring boys."[81] These works were not simply created for fun— rather, their accessibility allows for immediate engagement with important topics. This quality is evident in Dunaway's work, and functions in tandem with her dedication to maintain the seriousness of her practice. The balloon is ostensibly a toy, but Dunaway has shown that it is staunchly feminist, and certainly not boring. Its tantalizing accessibility to the wider public is a great asset for Dunaway's work. And, with pieces such as *40 Reasons Why Whores Are My Heroes*, *Affirmative Action*, and *Flying Fuck*, Dunaway clearly advocates the playful, yet radical sexual freedom championed by the cyberfeminists.[82]

---

80. "At the Adelaide Festival, about 30 women donated body parts by scanning their chosen flesh and digitally recording sound. From these, conglomerate bodies were created, animated and made interactive." Linda Dement, "Cyberflesh Girlmonster 1995," 2016, accessed Jan. 29, 2017, http://www.lindadement.com/cyberflesh-girlmonster.htm

81. "100 anti-theses: What Cyberfeminism is Not," archived at the *Old Boys Network* website, accessed May 5, 2016, http://www.obn.org/cfundef/100antitheses.html

82. *40 Reasons…* is scored for three singers with ensemble and reflects Dunaway's time as an activist for sex workers. *Affirmative Action* features a male percussionist gyrating into sensors, which trigger photos of predominately male composition professors in American universities in 2002. *Flying Fuck* is an installation for donut-shaped balloons pierced with vibrators, all of which are hung from the ceiling. From email correspondence with Dunaway, February 2017.

The body politics put forward by this movement exists, ironically, in the completely non-tactile realm of digital information. Nonetheless, the anonymity of the internet is a platform for "identity exploration and projection"[83] — where one could try out, for example, a dominant personality along with a more assertive style of communication. It is a place where the privileges and entitlements typically controlled by men are available to women as well. Thus, even in a virtual space, this experience is transformative for the user, since the "gender cues… direct and constrain traditional oral, visual and tactile forms of communication" in real-life interactions.[84] Judy Dunaway's balloon works attempts to transfer this idealized figure of cyberfeminist empowerment back to the physical world, through a comprehensively tactile approach to music-making.

While Dunaway's explicit focus on physical materials and gestures is part of a rich experimental tradition in the United States[85], her singular dedication to the balloon has yielded a musical practice that is uniquely conducive to a study such as this. In addition to her exploration of the balloon as a flexible and sonically diverse instrument, Dunaway's responsiveness to the sensations of the balloon informed the development of her performance technique. As a virtuosic performer and captivating improviser, Judy Dunaway has found success through her cutting-edge sound world. However, the subtleties and complexities of balloon performance practice become problematic when confronted with notation, especially when attempting to preserve sensations as written material. These issues are not uncommon to composers who experiment with new mediums, techniques, and syntaxes. In her unique way, Dunaway has elevated the balloon from children's party toy into a vehicle for feminist political statement, incorporating the object's real-world connotations with her own intentions and desire to create new meaning.

---

83. Susan Luckman, "(En)gendering the digital body: Feminism and the Internet," *Hecate* 25, no. 2 (1999): 40-1.

84. Ibid.

85. In the first chapter of *Experimental Music,* Michael Nyman attempts to define this tradition, beginning with the attitudes behind John Cage's 4'33". Most pertinent to Dunaway's work are the musical consequences of treating the instrument as "total configuration"— using the instrument as open sound source, rather than in fulfillment of a traditional role.

BIBLIOGRAPHY

Arias, Ricardo. “From the Margins of the Periphery: Music and Technology at the Outskirts of the West: A Personal View." The MIT Press. Leonardo Music Journal, Vol. 8, “Ghosts and Monsters: Technology and Personality in Contemporary Music” (1998), p. 49-54.

Balzer, Mark, Sheena K. Beaverson, and Larry Moss of Balloon HQ, LLC. “Guide to Balloons and Ballooning." http://www.balloonhq.com/faq/ Accessed Apr. 30 2016.

“Bernhard Leitner & Sound-Space-Sculpture," Vimeo video. Uploaded by KA21 / CastYourArt on March 6, 2016. https://vimeo.com/157713877

Burrows, David. “Instrumentalities." University of California Press. The Journal of Musicology, Vol. 5, No. 1 (Winter, 1987), p. 117-125.

Dunaway, Judy. *Balloon Music.* Composers Recordings, Inc/CRI NWCR778, 1998.

Dunaway, Judy. E-mail correspondence. April 2016 and February 2017.

Dunaway, Judy. *For Bass Koto with Balloons*. Frankfurt: Material Press, 2003.

Dunaway, Judy. “JUDY DUNAWAY and the evan gallagher little band.” 2000. http://www.jeweltone16.org/judydunaway/jdeglb/

Dunaway, Judy. *Mother of Balloon Music.* Innova 648, 2006. Liner Notes. http://www.innova.mu/sites/www.innova.mu/files/liner-notes/648.htm

Dunaway, Judy. “My Beautiful Balloon, Part I: A History of the Balloon as a Sound Producer in Experimental Music.” *Musicworks Magazine*. Fall 2001, p. 14-21.

Dunaway, Judy. “My Beautiful Balloon, Part II: Orchestration and Playing Techniques for Balloons as Sound Producers.” *Musicworks Magazine*. Winter 2002, p. 40-46.

Dunaway, Judy. *On the Air.* Frankfurt: Material Press, 2007.

Dunaway, Judy. *The Sound of Skin*. Frankfurt: Material Press, 2003.

Evans, Claire L. "'We Are the Future Cunt': CyberFeminism in the 90s." Nov. 14, 2014. http://motherboard.vice.com/read/we-are-the-future-cunt-cyberfeminism-in-the-90s

"For Chorus and Balloons." YouTube video. Presented at by The Wesleyan Singers and Judy Dunaway at Crowell Concert Hall, Wesleyan University, Middletown, Connecticut, May 5, 2000. Upload by russl375101 on Feb. 28, 2014. https://www.youtube.com/watch?v=nV3iuS-tOYI

"For Giant Balloon and So - Judy Dunaway." YouTube video. With Judy Dunaway (balloon) and Godfried-Willem Raes (automated Sousaphone). From a live performance at Logos Foundation, Gent, Belgium, October 22, 2014. Uploaded by jeweltone16ONE on Dec. 23, 2014. https://www.youtube.com/watch?v=v5Ruq6Csiro

Gann, Kyle. *Music Downtown: Writings from the Village Voice*. Berkeley: University of California Press, 2010.

Hapgood, Susan and Jennifer Rittner. Performing Arts Journal, Inc. "Neo-Dada: Redefining Art, 1958-1962." Performing Arts Journal, Vol. 17, No. 1 (Jan., 1995), p. 63-70.

"Jill Burton (voice), Judy Dunaway (balloon) and Jane Scarpantoni (cello)." YouTube video. Live improvisation at the COMA series at ABC No Rio, NYC on October 21, 2012. Uploaded by russl375101 on October 25, 2012. https://youtu.be/hawI5eDlyN4.

"Judy Dunaway: Reed Balloon Improvisation." YouTube video. From a live performance at Logos in Gent, Belgium, 2002. Uploaded by jeweltone16ONE on May 30, 2008. https://www.youtube.com/watch?v=3gPbTdWw7yw

"Judy Dunaway: Drone Improvisation on Bass Balloon." YouTube video. Performed by Judy Dunaway at Logos in Gent, Belgium, 2002. Uploaded by jeweltone16ONE on May 30, 2008. https://www.youtube.com/watch?v=aWpqZckpsUY

"Judy Dunaway: Hommage à Kenneth Noland." YouTube video. From a performance at Spectrum, New York City in September 2016. Uploaded by jeweltone16ONE on Oct. 25, 2015, https://www.youtube.com/watch?v=ed3UV7_JThc

"Judy Dunaway @ Interpenetration 1.4.3" YouTube video. Live Performance at chmafu nocords' Interpenetration, Forum Stadtpark, Graz, Austria, November 16, 2014.Uploaded by marufura on Jan 16, 2015. https://www.youtube.com/watch?v=atvJ6BctJEA

"Judy Dunaway - Live at 109 Gallery NYC." YouTube video. Judy Dunaway (balloon), from a performance at New York City's 109 Gallery on November 9, 2012. Uploaded by jeweltone16ONE. https://www.youtube.com/watch?v=0PJ9sAzYk78"

"Judy Dunaway: Manual Eardrums & The Globe," exhibition program notes. Interview of Judy Dunaway by Knut Remond. November 2013. *Berlin-Neukoelln*, December 8 and 15, 2013. http://www.jeweltone16.org/JudyDunaway/ohrenhoch_interview.html

"Judy Dunaway: Piece for Tenor Balloon (excerpt)." YouTube video. From a live performance at Logos in Gent, Belgium, 2002. Uploaded by russl375101 on May 30, 2008. https://www.youtube.com/watch?v=eUoLIQR4Rg4

"Judy Dunaway - Works for Balloons (overview)." YouTube video. Uploaded by russl375101 on March 2, 2014. https://www.youtube.com/watch?v=zL5h4I47szQ

Luckman, Susan."(En)gendering the digital body: Feminism and the Internet." *Hecate*, Vol. 25, No. 2 (1999), p. 36-47.

Mueller, Torsten, Kunsu Shim and Gerhard Staebler. *SoundVisions*. PFAU Verlag, Saarbruecken: 2005.

Phillips, Adam. *Voice of America*. Interview. "Avant-Garde Music for Toys, 'Playing' in New York," April 1, 2009. http://www.audiobyadam.com/tag/avant-garde/

Munari, Burno. *Square Circle Triangle.* New York: Princeton Architectural Press, 2016.

Nyman, Michael. *Experimental Music: Cage and Beyond.* New York: Cambridge University Press, 1999.

O'Brien, Kerry . "Listening as Acitvism: The "Sonic Meditations" of Pauline Oliveros." *The New Yorker*, December 9, 2016.

Oliveros, Pauline. *Sonic Meditations*. Smith Publications, 1974.

Ouzounian Gascia. "Embodied sound: Aural architectures and the body." *Contemporary Music Review,* Vol. 25:1-2, p. 69-79.

Pareles, Jon. "The Pop Life" *The New York Times.* October 7, 1987. http://www.nytimes.com/1987/10/07/arts/the-pop-life-837987.html

Paul, Christiane. *Digital Art*, 2nd Edition. London: Thames & Hudson, 2008.

Prendergast, Mark. *The Ambient Century: from Mahler to Trance— the Evolution of Sound in the Electronic Age.* London: Bloomsbury Publishing, 2000.

Pritchett, James. *The Music of John Cage.* New York: Cambridge University Press, 1996.

"The Sound of Skin - a Fluxus score by Judy Dunaway." YouTube video. Performance by The Kattt Sammon Ensemble at ACME Observatory, San Francisco, California, December 2003. Uploaded by jeweltone16ONE on March 27, 2014. https://www.youtube.com/watch?v=xZ_Q5R-1_w4

Richards, John. "Getting the Hands Dirty." The MIT Press. Leonardo Music Journal, Vol. 18, "Why Live? Performance in the Age of Digital Reproduction" (2008), p. 25-31.

Saunders, James, Ed. *The Ashgate Research Companion to Experimental Music.* Burlington: Ashgate Publishing, 2009.

Schiemer, Greg. "Improvising Machines: "Spectral Dance" and "Token Objects"." The MIT Press. Leonardo Music Journal, Vol. 9, Power and Responsibility: Politics, Identity and Technology in Music (1999), p. 107-114.

Various. "Ricardo Arias. Música Global, a Berlston Release." CD reviews. http://www.nurnichtnur.com/printreviews/arias_musicaglobal.htm

Wickman, Forrest. "This Party's Blowin' Up: Why we celebrate with balloons?" *Slate Magazine* online. December 13, 2011. http://www.slate.com/articles/life/explainer/2011/12/party_balloons_a_history.html

Wilding, Faith. "Where is Feminism in Cyberfeminism?" Presented at the First Cyberfeminist International Kassel, Germany, September l997. Archived at the *Old Boys Network* website. http://www.obn.org/reading_room/writings/html/where.html

Wlodarczyk, Justyna. *Ungrateful Daughters: Third Wave Feminist Writings.* Tyne: Cambridge Scholars Publishing, 2010.

Zentrum für Kunst und Medientechnologie, Ed. *Bernhard Leitner .P.U.L.S.E.* Ostfildern: Hatje Cantz Verlag, 2008.

A PORTFOLIO OF THREE COMPOSITIONS

A Dissertation
Presented to the Faculty of the Graduate School
Cornell University
in Partial Fulfillment of the Requirements for the Degree of
Doctor of Musical Arts

by
Tonia Chi Wing Ko
May 2017

A PORTFOLIO OF THREE COMPOSITIONS

Tonia Chi Wing Ko, D.M.A.
Cornell University 2017

All of the pieces in this portfolio are concerned with embodiment, manifesting in vocalization, spatially-informed orchestration, and physical choreography.

Hush is a twelve-minute work for percussion and cello, written for New Morse Code. Over the course of three movements, the performers vocalize, speaking and singing fragments taken from Virginia Woolf's short story, *The String Quartet*. The text comments on concepts of nonsensical chatter, silence, and the beautiful simplicity of song.

Eyelids are Islands is an eleven-minute work for sinfonietta, composed for the Festival Chamber Orchestra while the composer was in residence at the Copland House during the winter of 2013-14. It reimagines the ensemble as an organic body, with each instrument fulfilling distinct musical functions. The energy activated by the double bass permeates the entire musical space, culminating in the shimmering, blinking sounds of the vibraphone and celesta.

Breath Contained II is a fourteen-minute work for bubble wrap quintet and live electronics. The mundane packaging material is transformed into a musical instrument that expresses through popping, rustling, and nuanced squeaks. While processing techniques of resonance and comb filters enhance the bubble wrap sounds, the performers must also learn the playing techniques developed by the composer, to explore the space where hand pressure meets friction.

BIOGRAPHICAL SKETCH

The music of Tonia Ko (b.1988) has been lauded by *The New York Times* for its "captivating" details and "vivid orchestral palette." Her interests in texture and physical movement play into a larger theme of interdependency between visual art and music. Tonia's music has been performed by ensembles such as Minnesota Orchestra, Volti, New York Youth Symphony, Flux Quartet, orkest de ereprijs, Eastman Wind Ensemble, and New Morse Code. She has been featured at nief-norf Summer Festival, Aspen Music Festival, Tanglewood Music Center, Shanghai New Music Week, and Santa Fe Chamber Music Festival. Tonia has received awards from the American Academy of Arts and Letters, BMI, Composers Now, as well as residencies at Copland House, Djerassi, and Atlantic Center for the Arts. She is represented by Young Concert Artists as 2015-2017 Composer-in-Residence. Her explorations as an artist have sparked interdisciplinary connections— most prominently *Breath, Contained*, an ongoing project using bubble wrap as a canvas for both art and sound. Born in Hong Kong and raised in Honolulu, she earned previous degrees from Indiana University and the Eastman School of Music.

DEDICATION

This portfolio is dedicated to the memory of Steven Stucky, who will continue to be my role model for his dedication to building community through music. He gave me a life-changing opportunity to study at Cornell and always believed in my work, without question.

ACKNOWEDGEMENTS

I would like to thank Kevin Ernste for opening my ears to new concepts and artistic directions, and for his guidance and support throughout my four years at Cornell. I am also very grateful to my collaborators for the three works in this portfolio: New Morse Code, Chris Kim and the Festival Chamber Orchestra, and Sandbox Percussion. My *Breath, Contained* project would not have been possible without Christopher Stark's tutelage in electroacoustic music during the Fall semester of 2013. I also want to express my gratitude to Michael Compitello for our numerous collaborations, and to Xak Bjerken for commissioning and programming my music. Finally, I learned invaluable lessons from my colleagues in the music department, and I would like to thank them for their feedback and friendship.

TABLE OF CONTENTS

Full Score

Hush

for percussion and cello

Tonia Ko (2012)

I. The Tongue is but a Clapper

The tongue is but a clapper. Simplicity itself.

II. How— Hush!

III. Simplicity Itself

One rose leaf, falling from an enormous height, like a little parachute dropped from an invisible balloon. Turns, flutters... It won't reach us.

from "The String Quartet" (1921) by Virginia Woolf

Program Notes

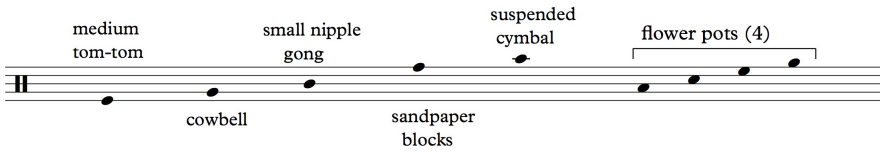
Hush, written for the adventurous duo New Morse Code, maps the concept of speech and song onto the instrumental combination of percussion and cello. Taking excerpts from Virginia Woolf's short story "The String Quartet," the performers convey the busy-ness of speech and conversation contrasted with the simplicity of song. The metaphor lends itself to extended roles for both performers-- unpitched (un-singing) percussion renders spoken words, while the cantabile cello sound dovetails into vocal singing. The middle movement reminds listeners of the worth in silences, which emerge when we care to hush.

Duration: 12 minutes

Percussion Instruments

vibraphone– with bow
sandpaper blocks
4 flower pots, low to high– specific pitches not necessary
cowbell– matching lowest pot as much as possible
small nipple gong
medium tom-tom– head slightly slackened

Key



Performance Notes

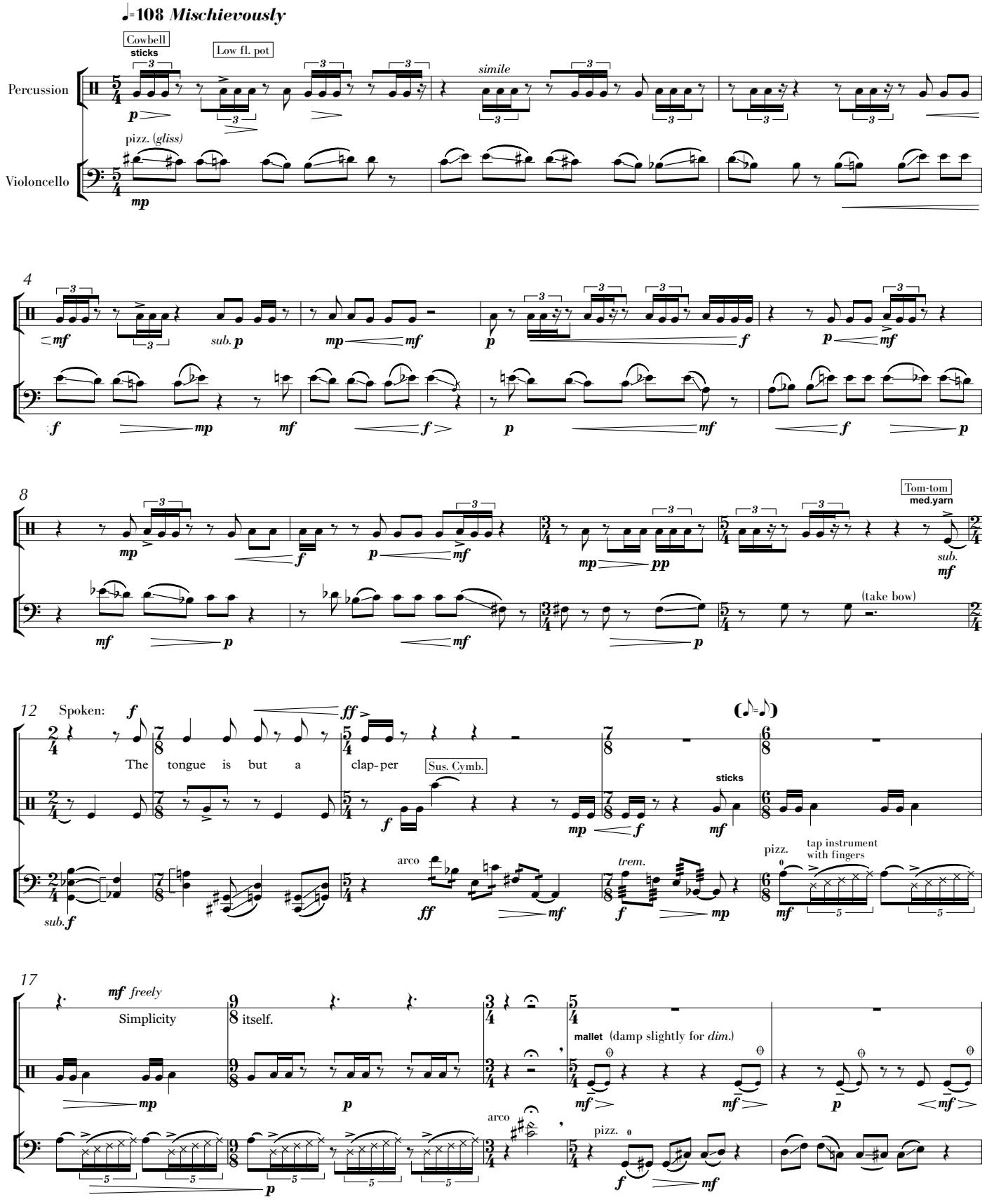
accidentals last until the end of the barline (solid or dashed)

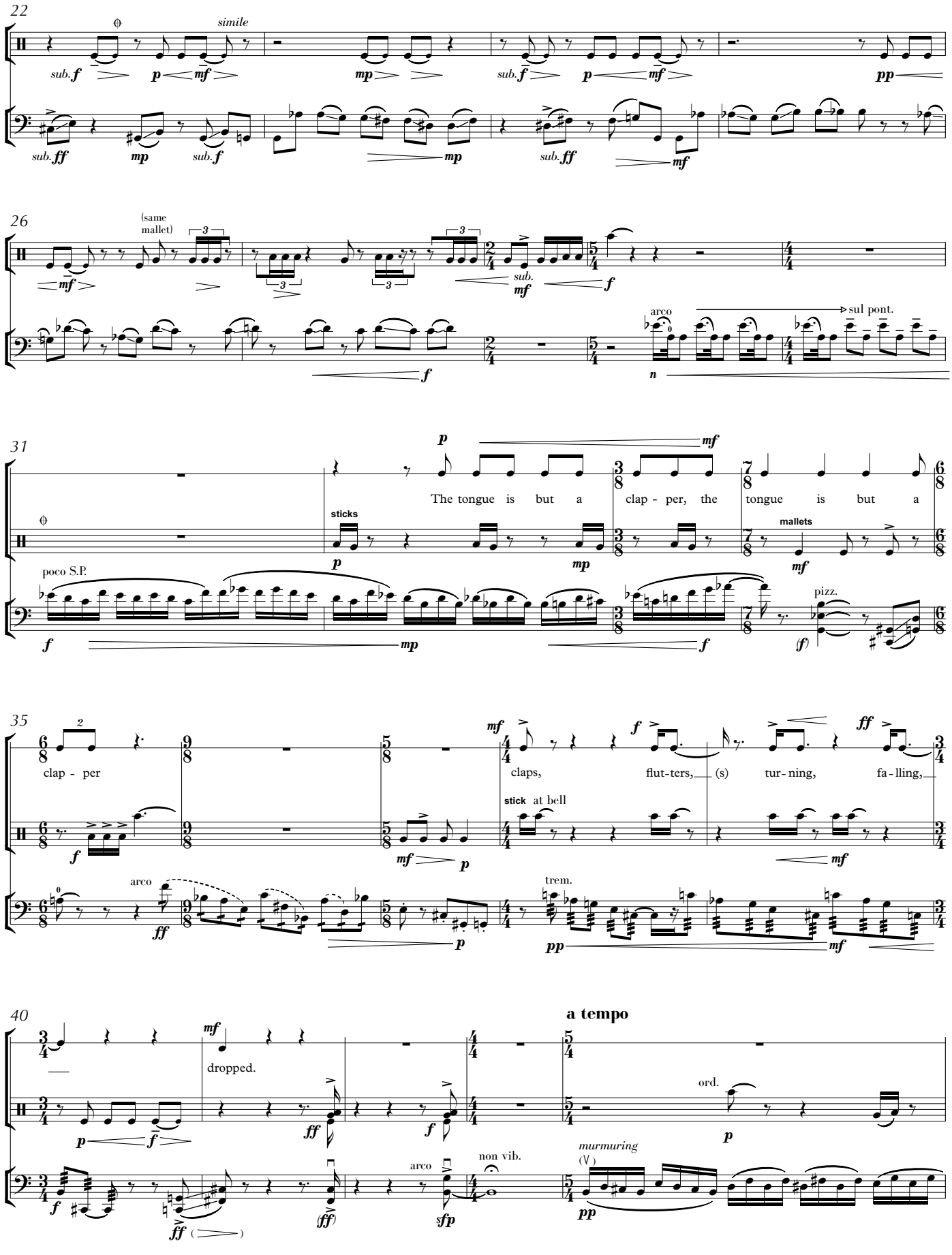
Hush

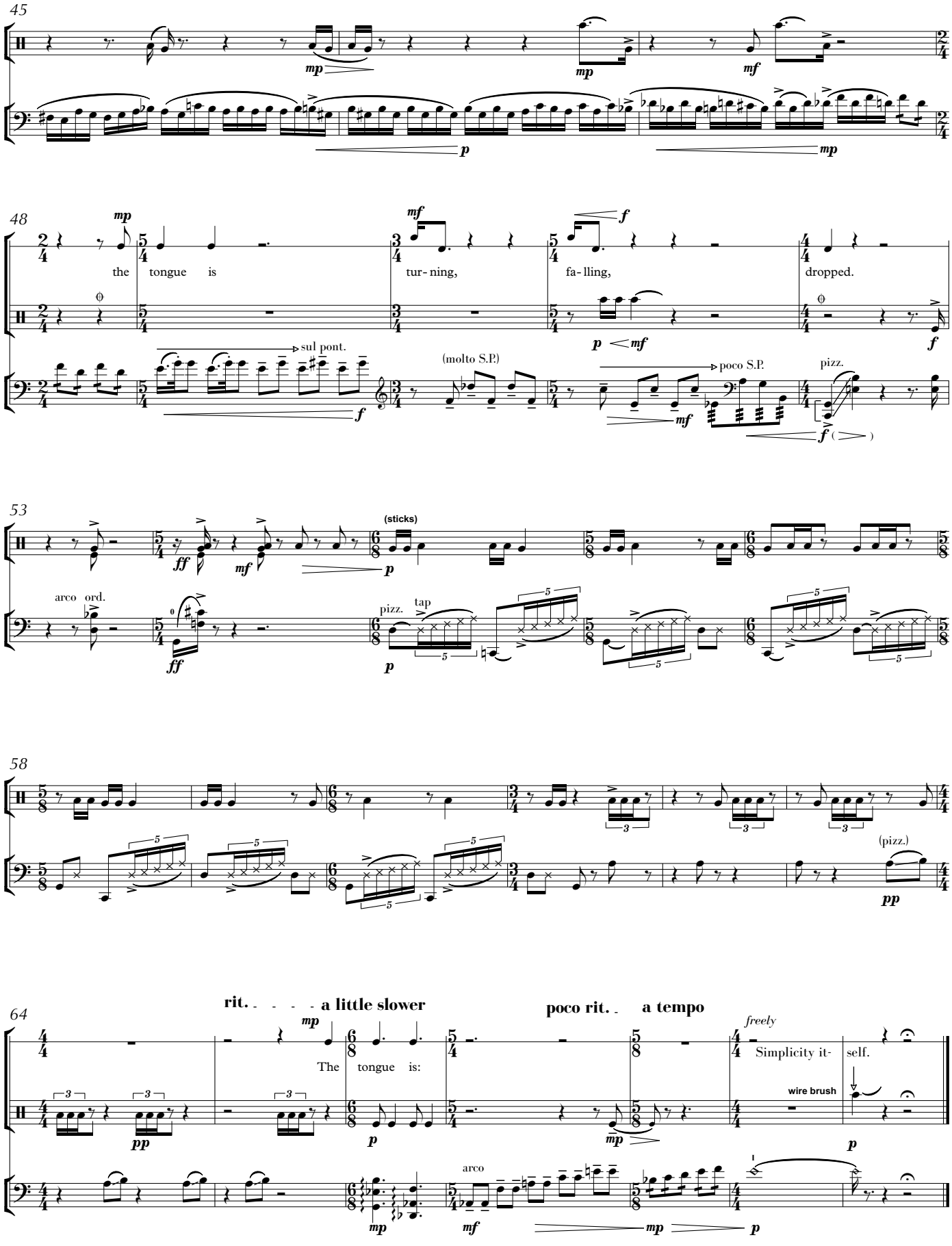
written for New Morse Code

Tonia Ko (b. 1988)

I. The Tongue is but a Clapper

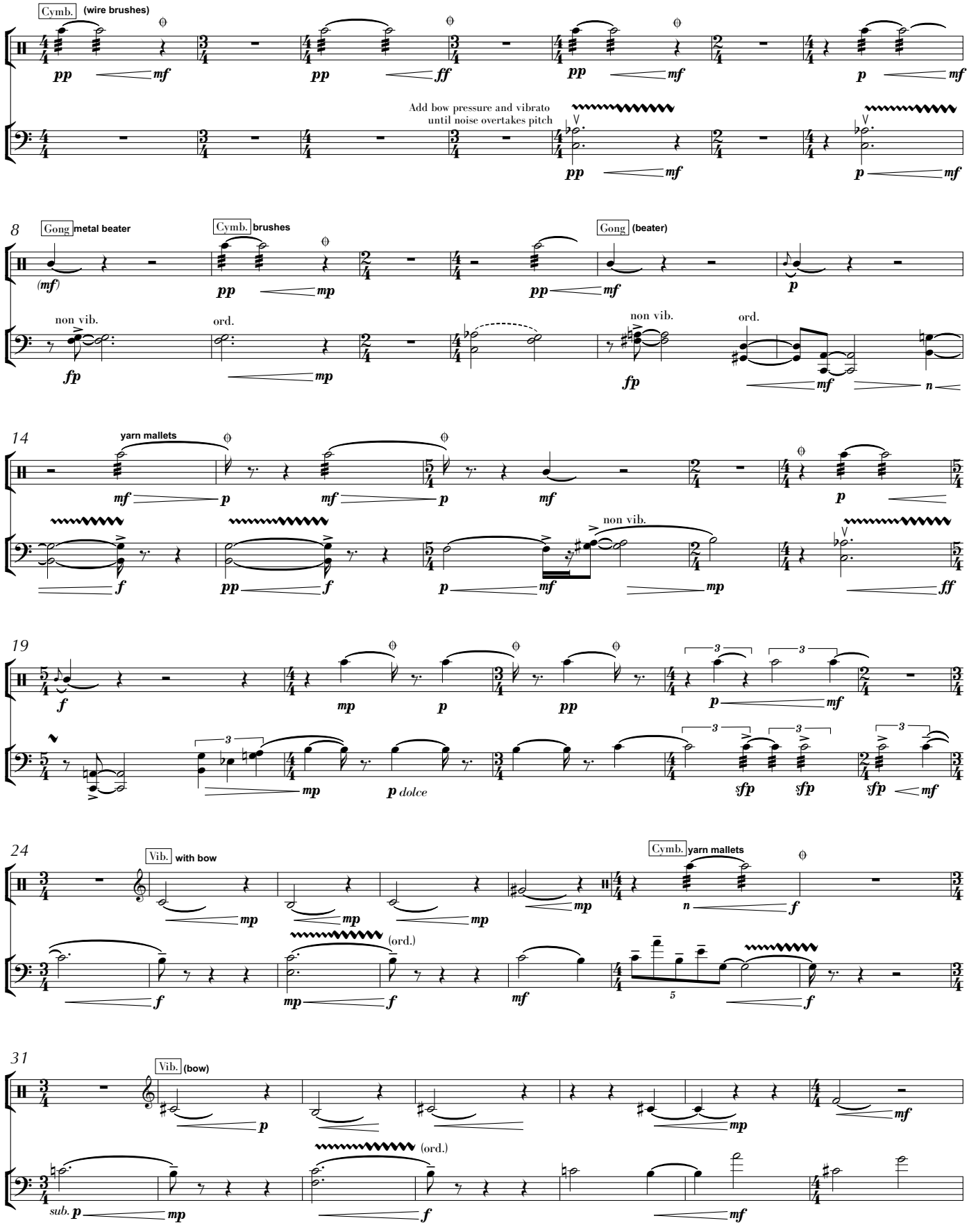


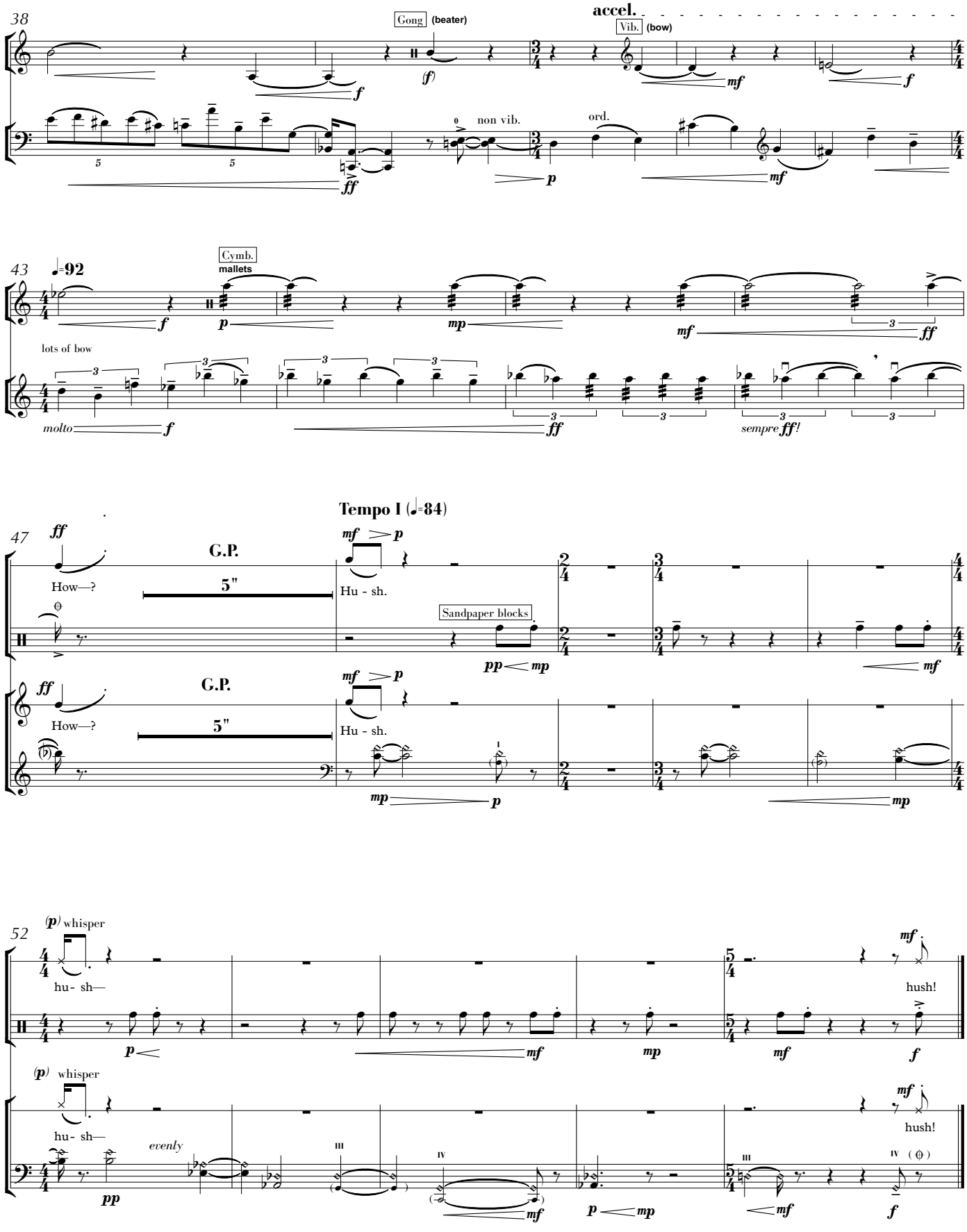

22
simile
sub. f
p
mf
mp
sub. f
p
mf
pp
sub. ff
mp
sub. f
mp
sub. ff
mf
26
(same mallet)
3
mf
sub. mf
f
arco
sul pont.
f
n
31
p
mf
The tongue is but a clap - per, the tongue is but a
sticks
mallets
poco S.P.
pizz.
f
mp
mp
f
(f)
35
clap - per
claps, flut-ters, (s) tur-ning, fa-lling,
stick at bell
f
mf
p
mf
arco
trem.
ff
p
pp
mf
40
a tempo
mf
dropped.
ord.
p
f
ff
f
p
arco
non vib.
murmuring
ff
(ff)
sfp
pp


45
48
the tongue is
tur- ning,
fa- lling,
dropped.
sul pont.
(molto S.P.)
poco S.P.
pizz.
53
(sticks)
arco ord.
pizz.
tap
58
(pizz.)
64
rit. a little slower
poco rit. a tempo
freely
The tongue is:
Simplicity it-
self.
wire brush
arco

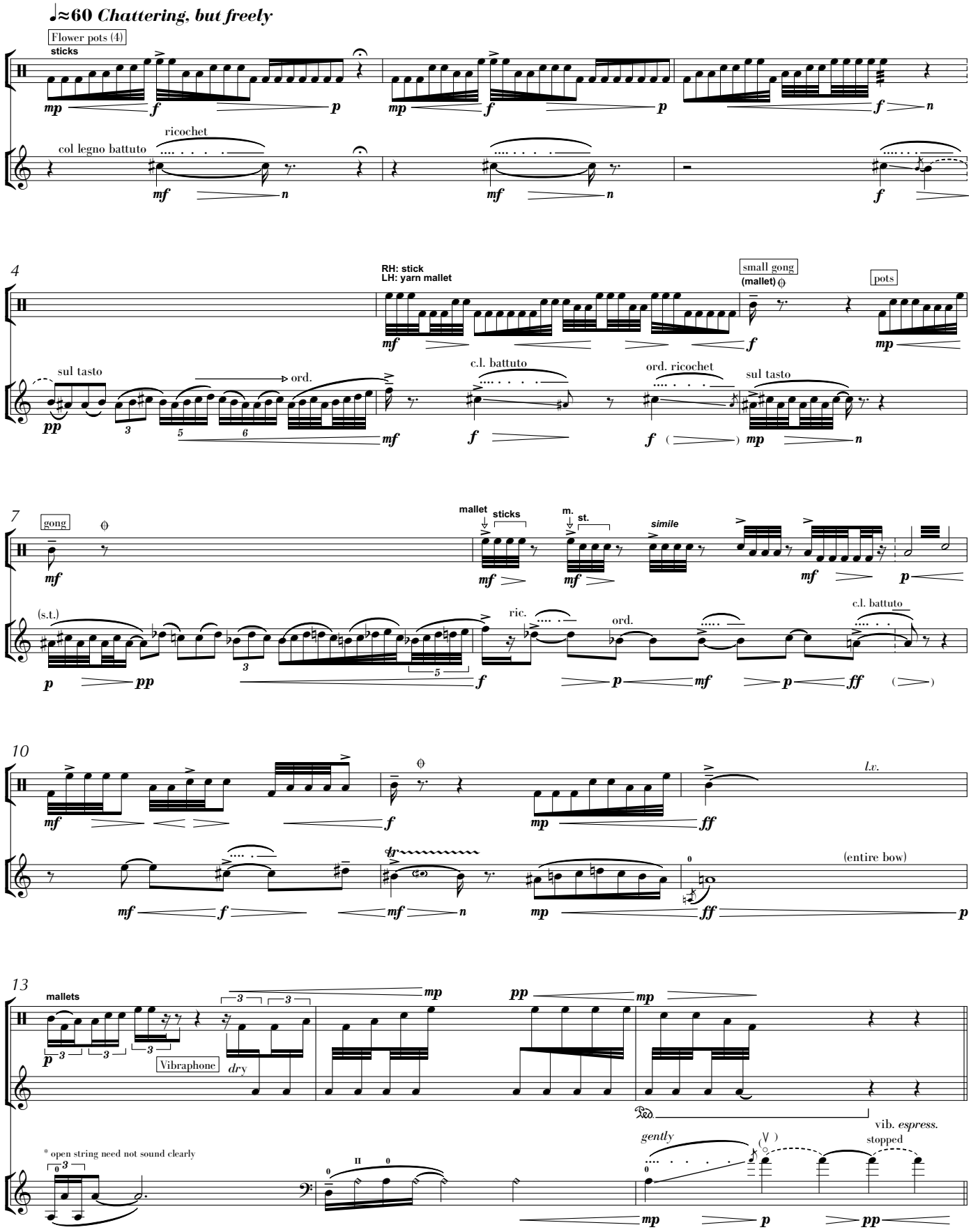
II.How– Hush!

♩=84 *Hesitant, with anguish*




38
Gong (beater)
accel.
Vib. (bow)
non vib.
ord.
43
Cymb.
mallets
lots of bow
molto
sempre ff!
Tempo I (♩=84)
47
G.P.
5"
How—?
Hu - sh.
Sandpaper blocks
52
whisper
hu - sh—
hush!
evenly

III. Simplicity Itself



Dreamy, yet always flowing onward

(♩ = **approx. 1 quarter note**)

16

Sung:

Rose fa - lling Rose

slight accel - - - - - -

* this rhythm should remain quick and in tempo throughout

19

fa - lling One leaf, fa - lling

21

from a bal - loon

not matching with voice

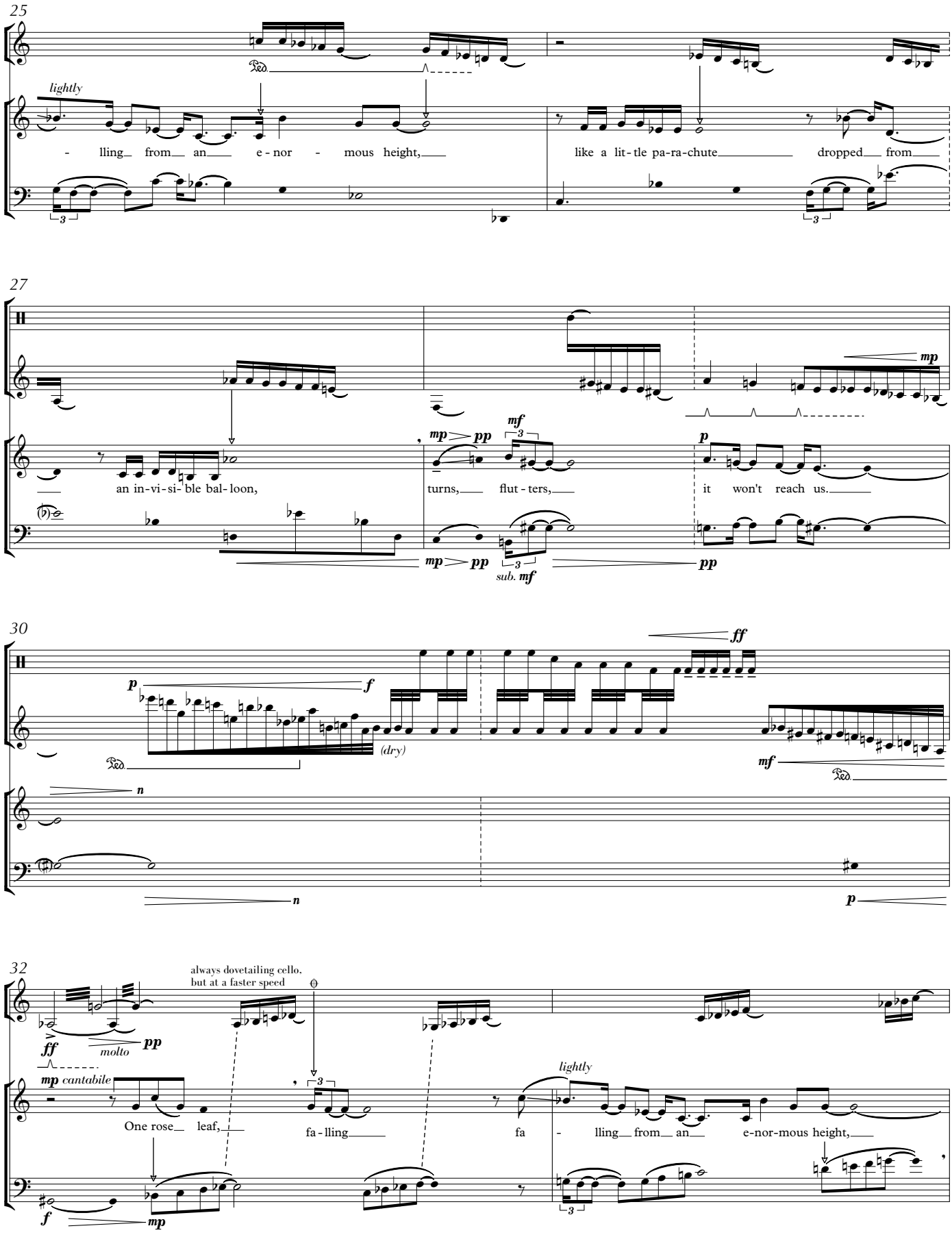
23

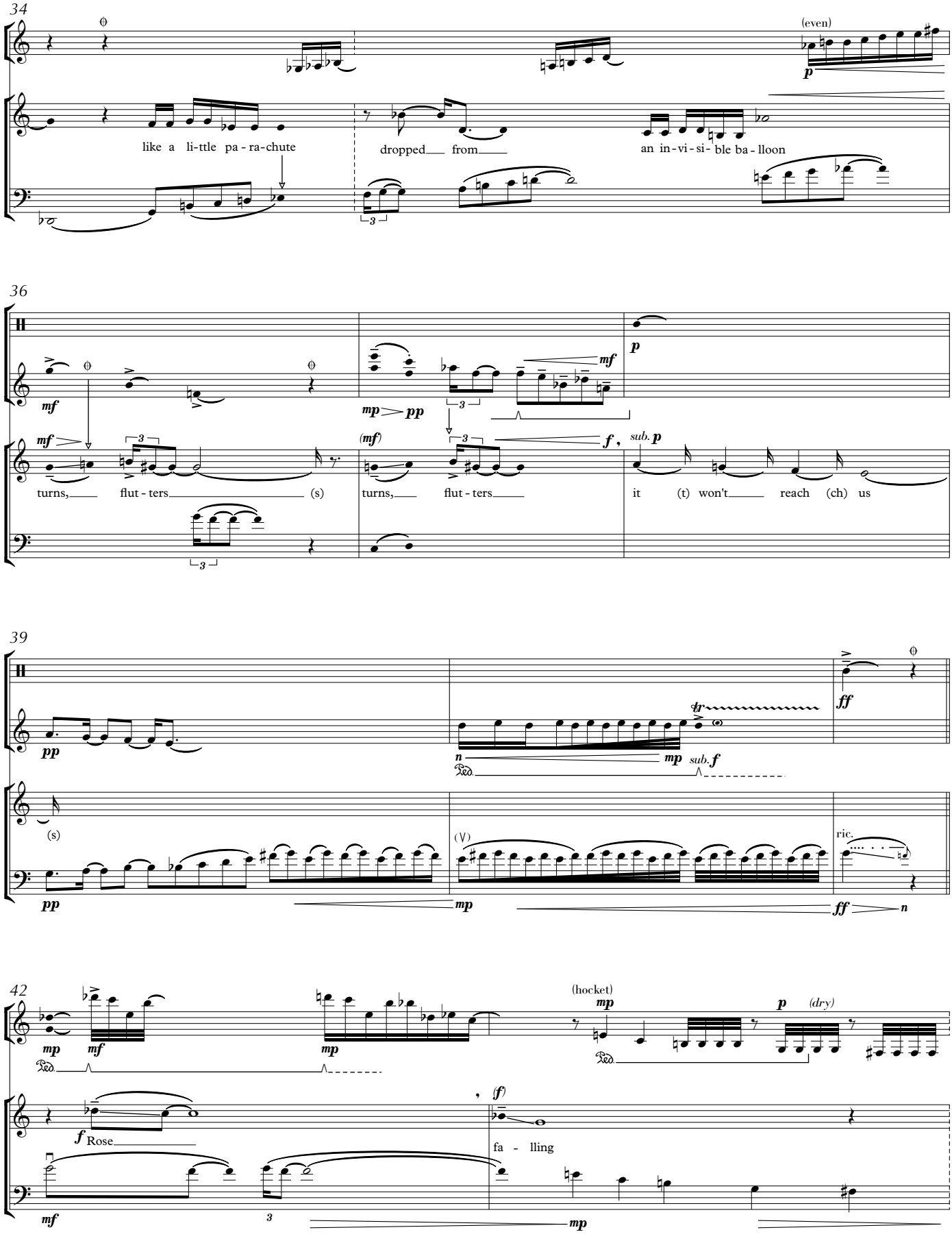
(more) a tempo

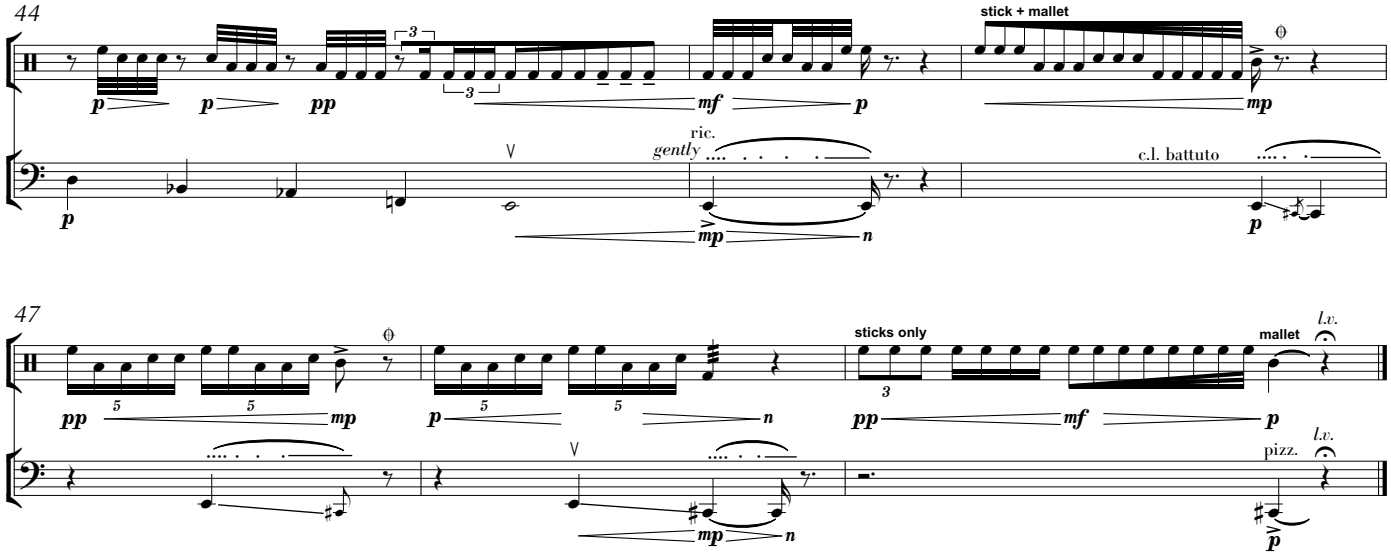
(dry)

start ***p****, as if sung to yourself*

One rose leaf, fa- lling fa -


25
lightly
- lling from an e - nor - mous height,
like a lit - tle pa-ra-chute dropped from
27
an in-vi-si- ble bal- loon,
turns, flut - ters,
it won't reach us.
mp
pp
mf
p
sub. mf
30
ff
(dry)
n
32
always dovetailing cello.
but at a faster speed
molto
cantabile
One rose leaf,
fa - lling
fa - lling from an e-nor-mous height,


34
(even)
like a li-ttle pa-ra-chute
dropped from
an in-vi-si-ble ba-lloon
36
turns, flut-ters (s)
turns, flut-ters
it (t) won't reach (ch) us
39
(s)
(V)
ric.
42
(hocket)
(dry)
Rose
fa - lling


44
stick + mallet
gently
ric.
c.l. battuto

47
sticks only
mallet
l.v.
pizz.

Eyelids are Islands

for sinfonietta

Tonia Ko (2014)

Palpebra sinistra, Palpebra destra...

When we finally blinked and opened our eyes, suddenly it appeared to be a completely different world. Even though all the same objects were there, we saw them anew, like in a dream, where you still call your best friend by the correct name even though he looked entirely like a stranger. Despite constantly blinking in an attempt to refresh what we see, as if to wake up, we actually keep jumping from island to island, landing on a new world each time.

The initial idea for **Eyelids are Islands** came from two works by visual artist Giuseppe Penone entitled "Palpebra sinistra" and "Palpebra destra" (left and right eyelid). His works were part of an Arte Povera exhibit in the Kröller-Müller Museum during my visit to The Netherlands in February 2013. These works, shown as a diptych, covered an entire sidewall of the gallery, but its physical scale was marked by utmost simplicity, consisting only of tessellations of a beautiful black charcoal pattern on drawing paper. Upon closer inspection, I learned that the patterns were all impressions of the skin on Penone's own eyelids. Thus in my piece, the types of dialogue occurring within the ensemble are informed by the dichotomies within our own bodies, the left and right sides, the internal and external.

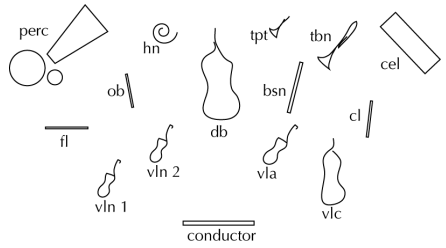
This work was composed while in residence at the Copland House, Cortlandt Manor, New York, as a recipient of the Copland House Residency Award.

Duration: 11 minutes

Instrumentation:

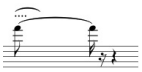
flute
oboe
clarinet in b-flat
basson
horn in F
trumpet in C
trombone
percussion : 32" timpano, vibraphone, small splash cymbal
celesta (5 octave)
violin 1
violin 2
viola
violoncello
double bass

Suggested set-up:

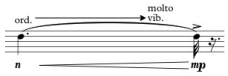


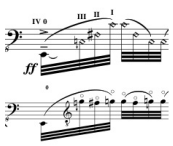
Performance notes:

Strings

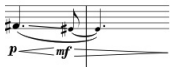
unmeasured ricochet; allow bow bounce to decay then sustain for indicated duration 

harmonic pizzicato; release hand to allow sound to ring as much as possible 

gradually change from one technique to another 

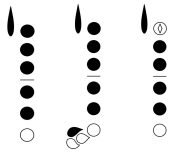
for bass; suggested fingering for harmonics provided along with sounding pitches (8vb) 

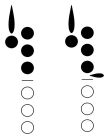
Winds

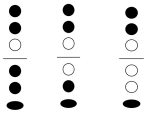
for horn; bend pitch down gradually with embouchure 

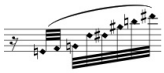
regarding timbre fingerings, suggestions are provided below.
specific order of alternation is not necessary.

flute D6: 

oboe E5: 

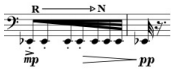
clarinet F5: 

bassoon: D#4 

half air, half pitch in tone 

Percussion

deadstroke, mallet remains on surface without rebound 

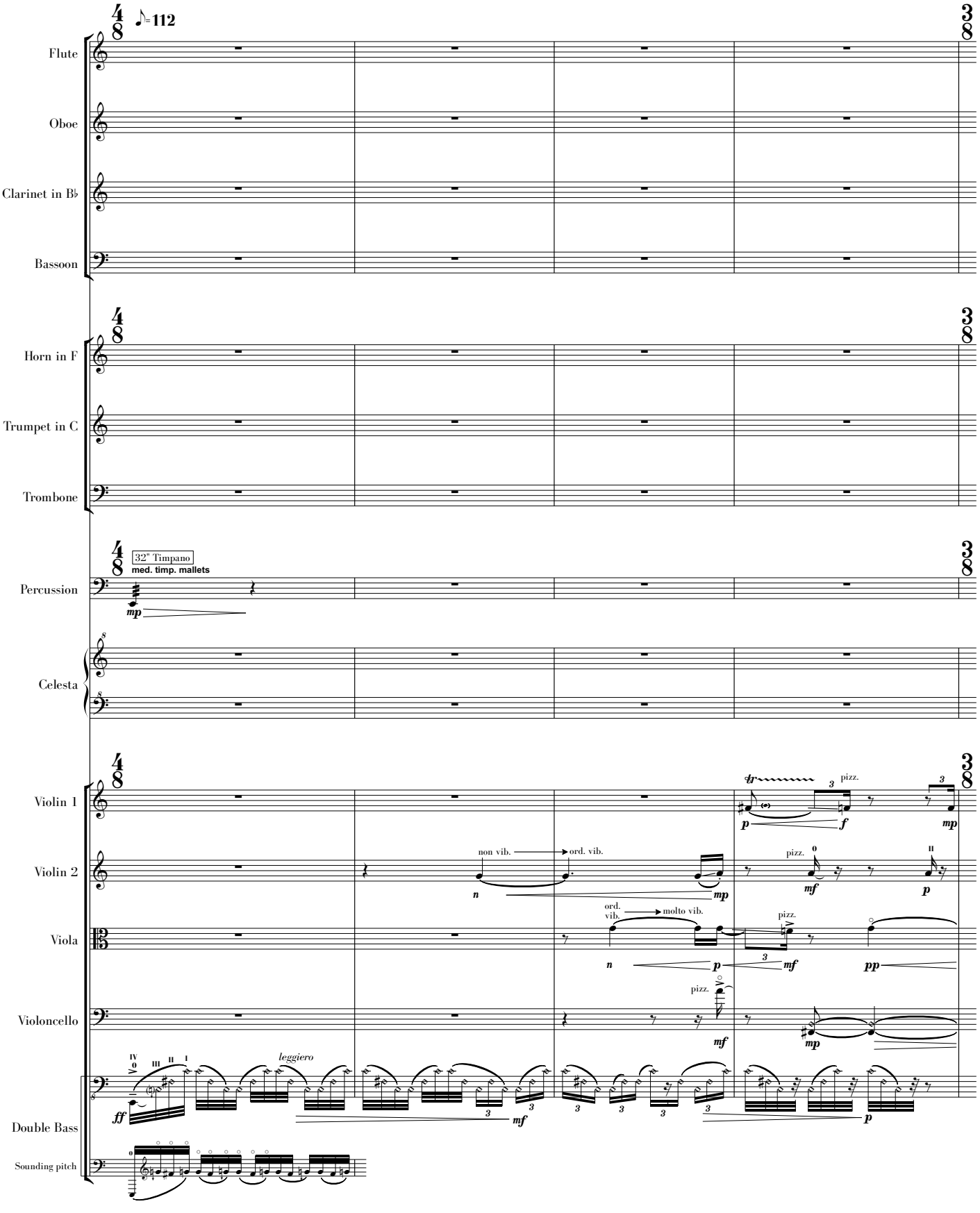
for timpani; bounce mallet on drum while moving from rim towards center, rapidly 

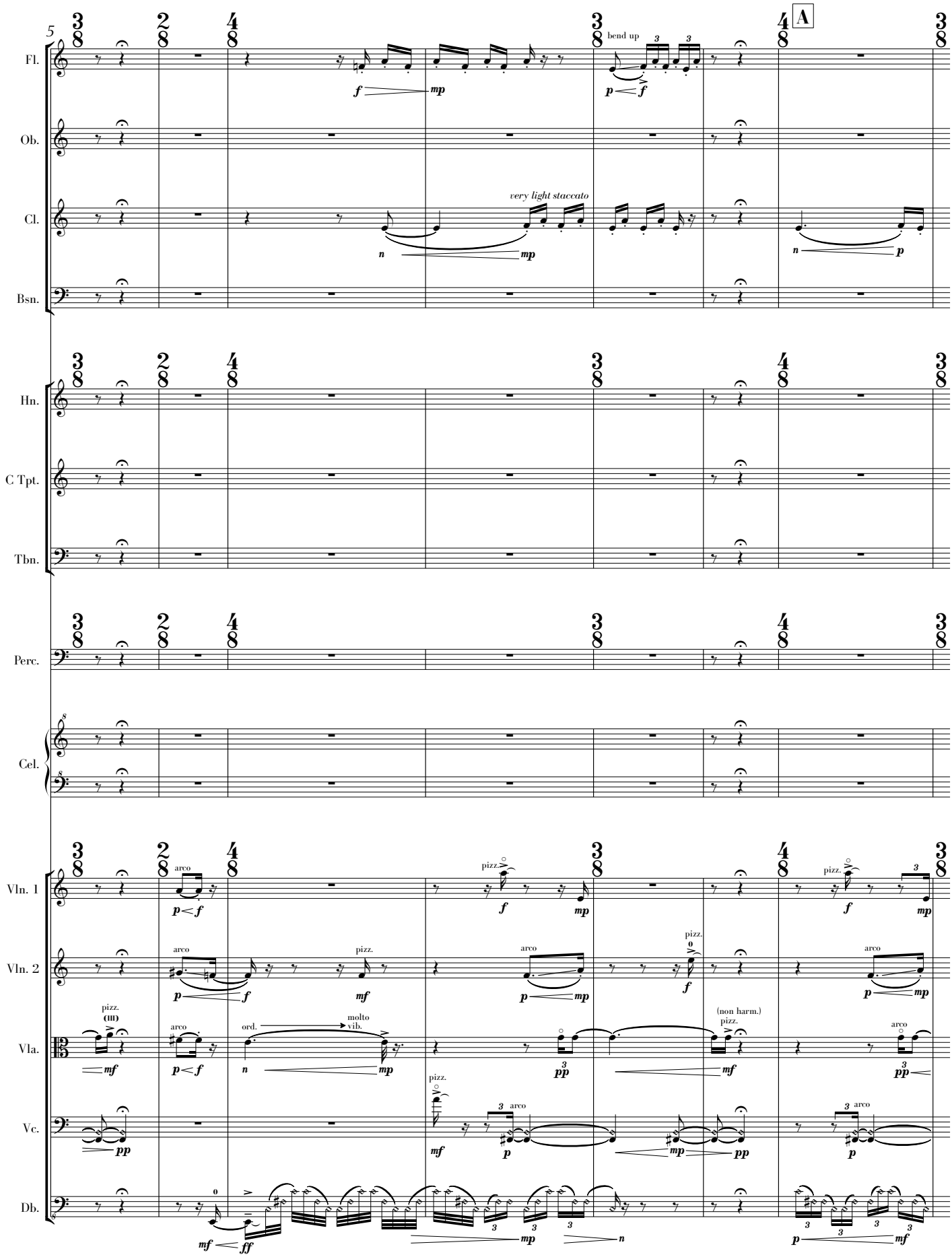
Eyelids are Islands

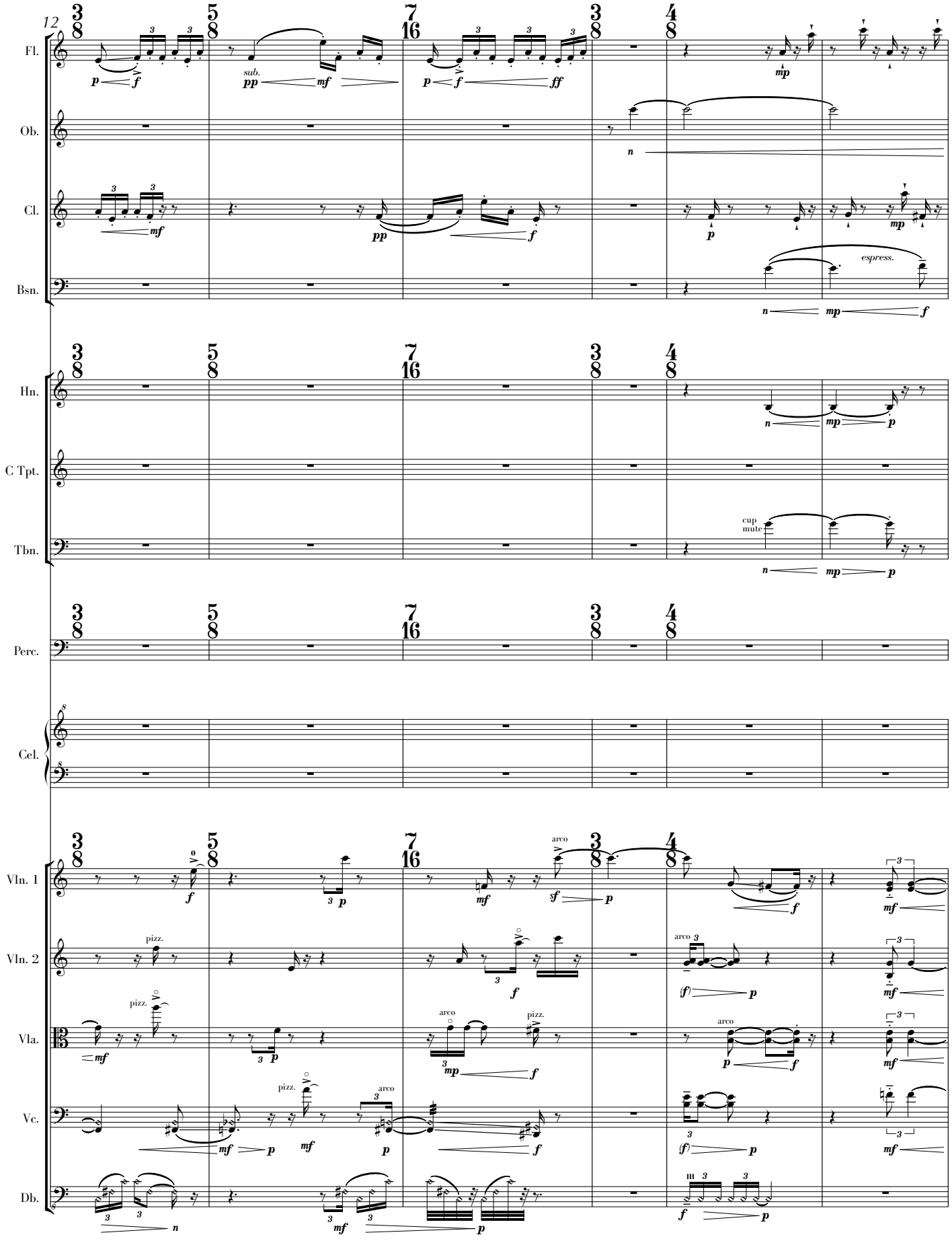
Written for the 2014 Festival Chamber Orchestra, Cornell University

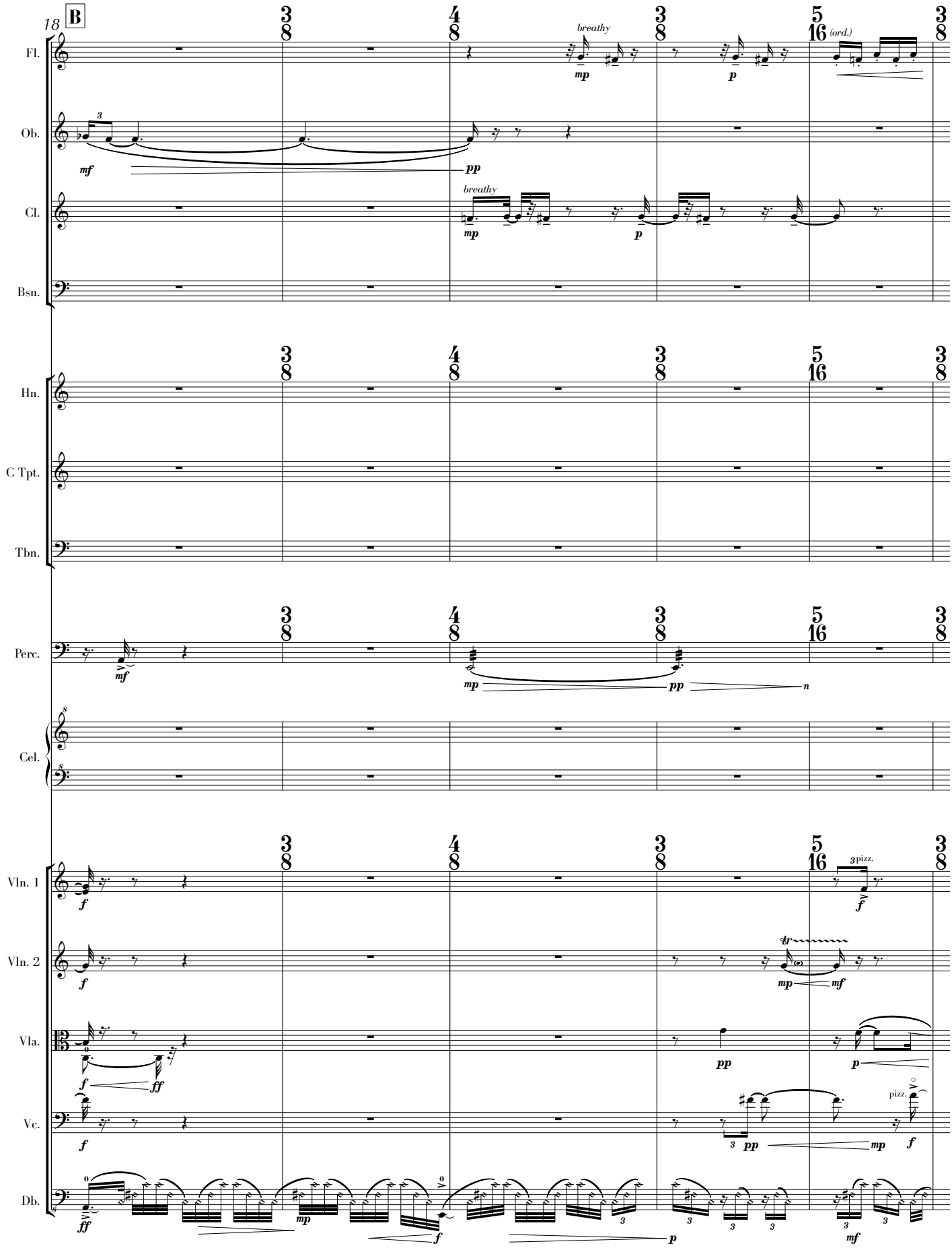
Tonia Ko (b.1988)

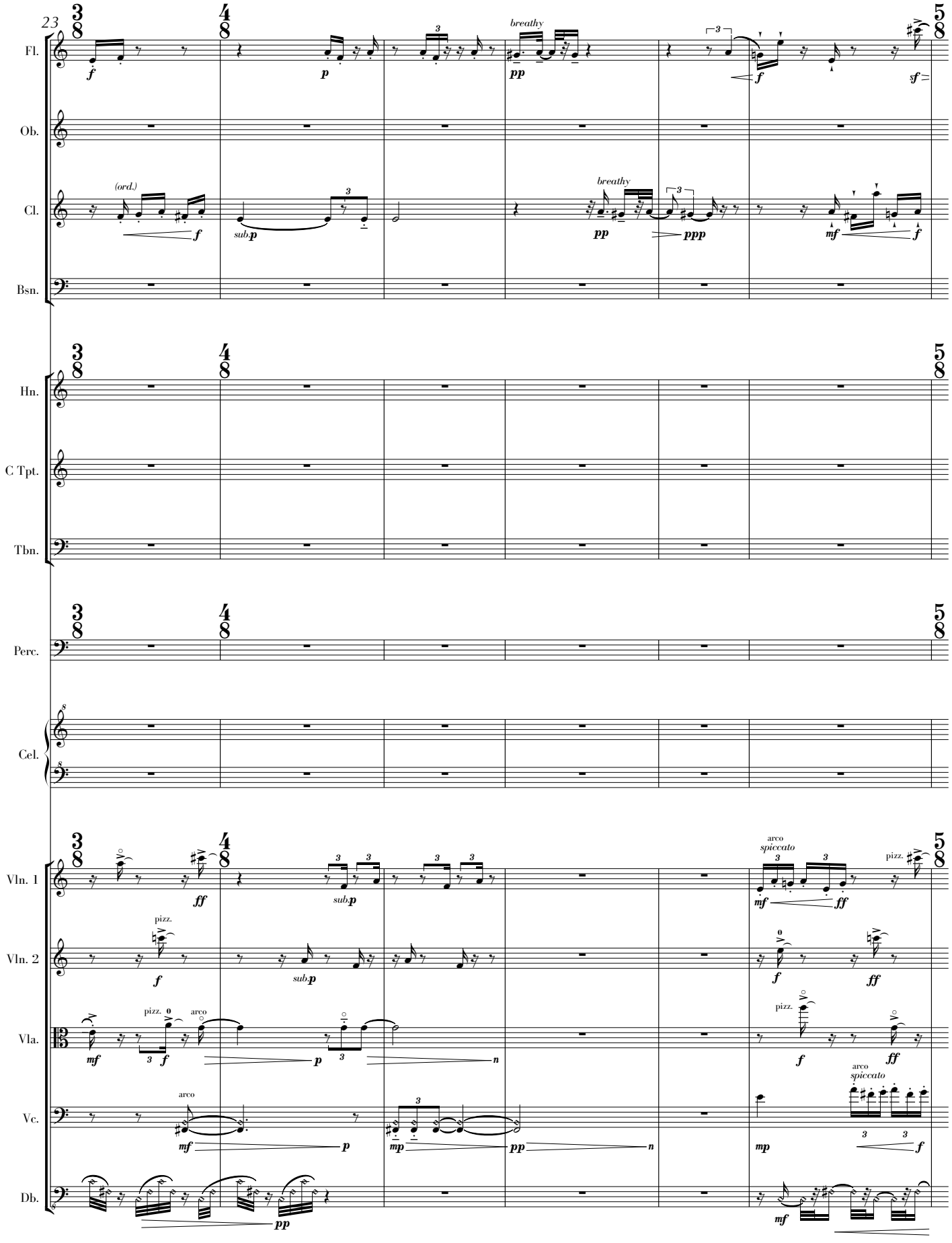
Score in C

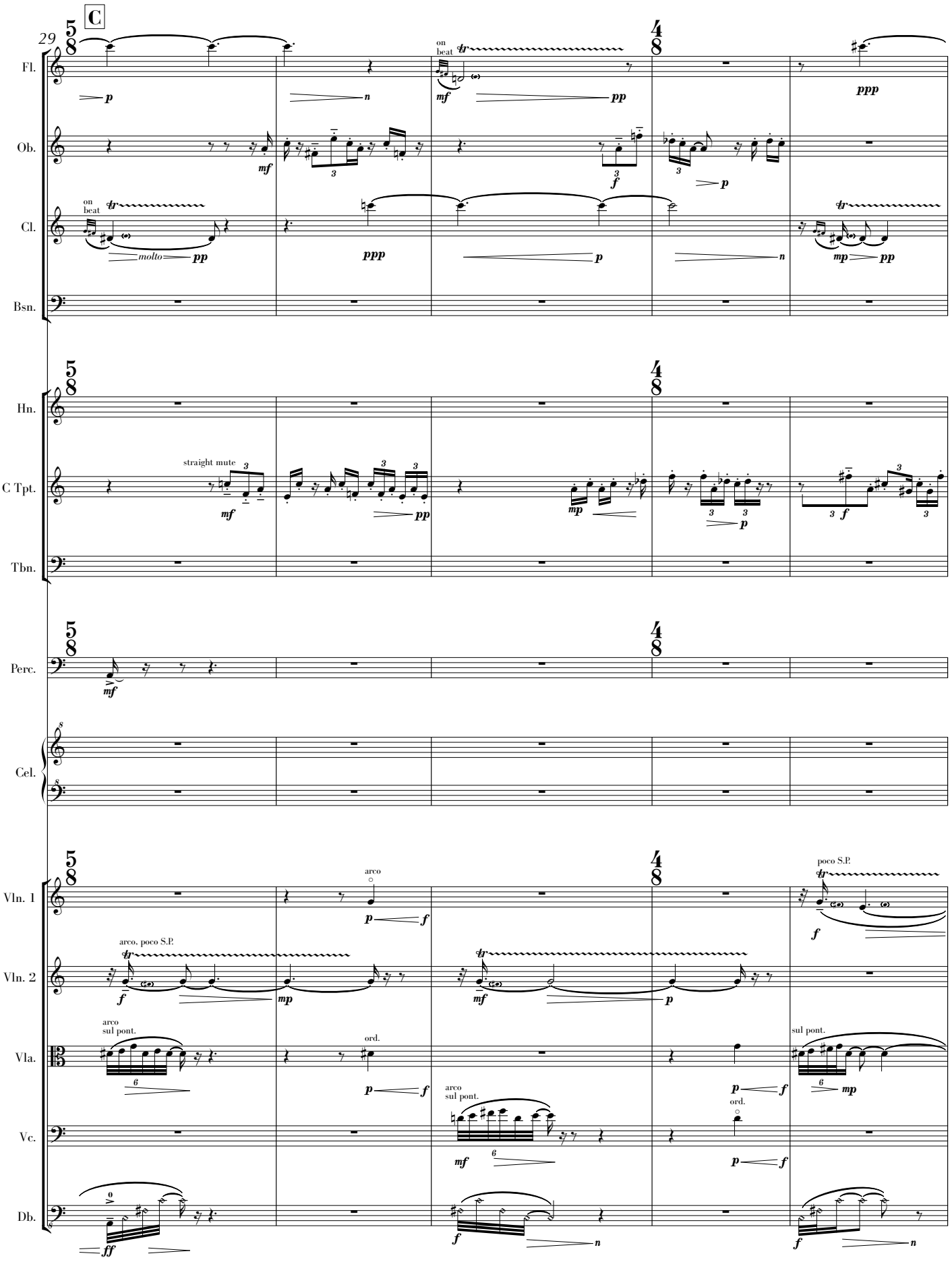


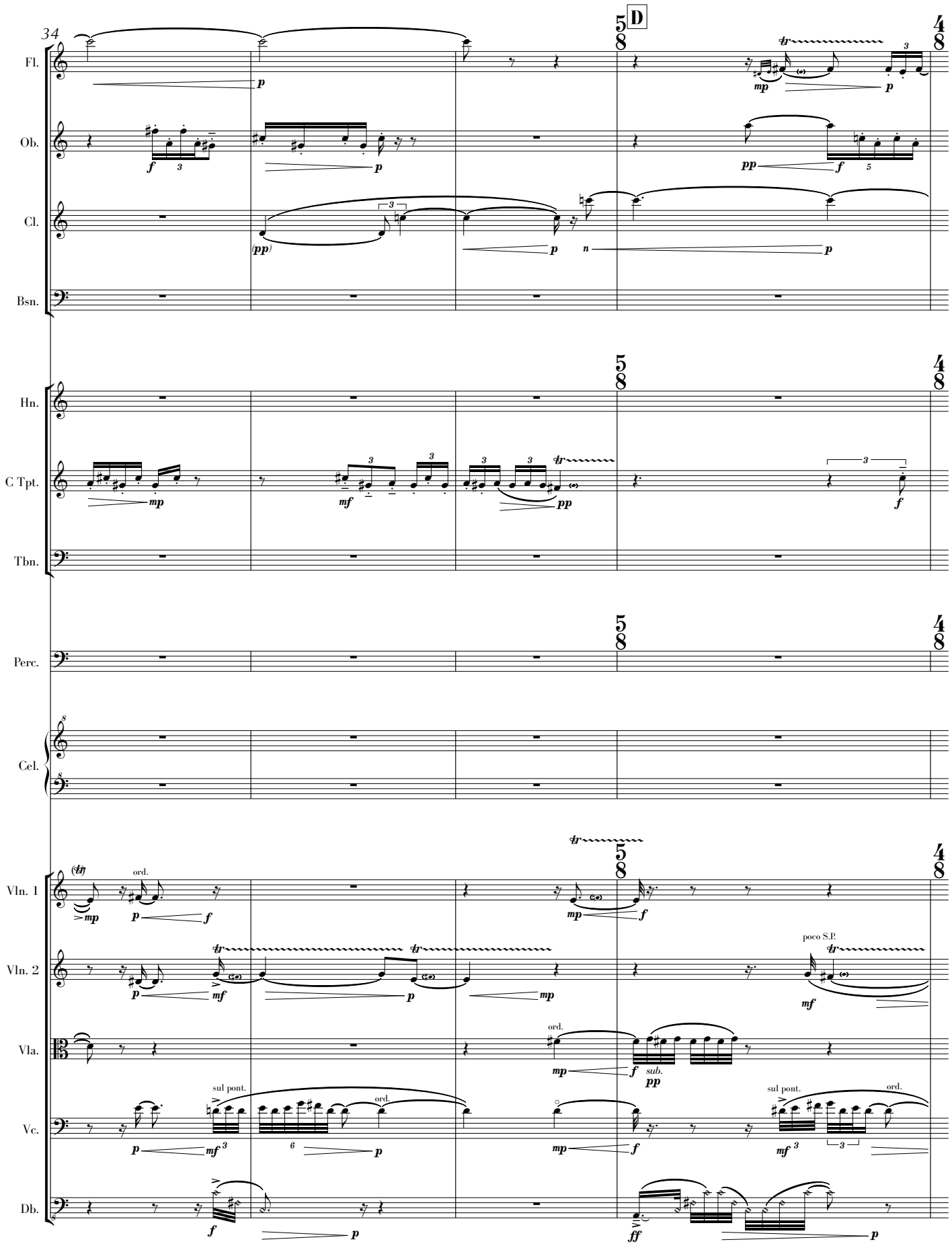

5
A
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
bend up
very light staccato
arco
pizz.
ord.
molto vib.
(non harm.)

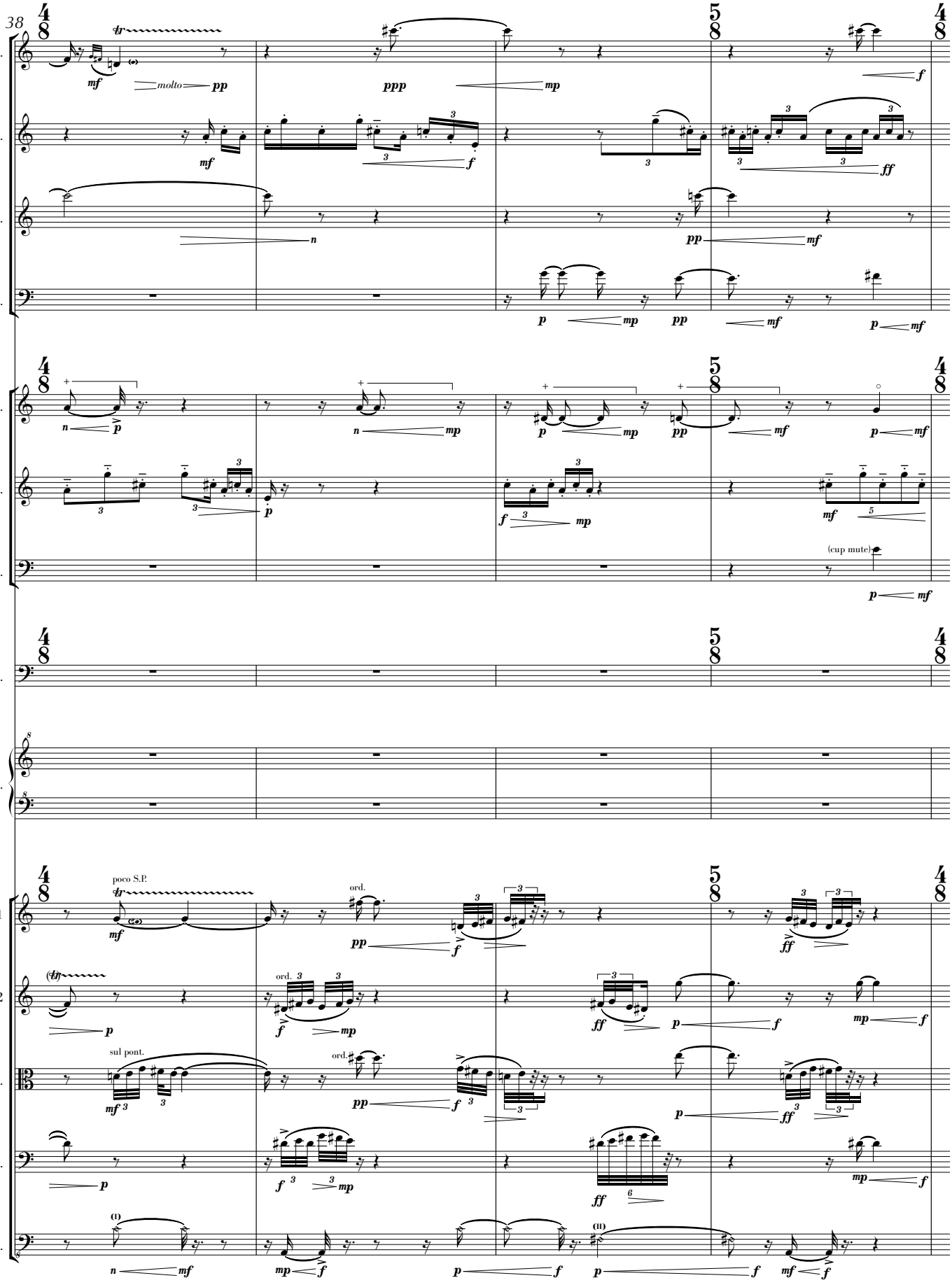

12
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
sub.
espress.
cup mute
pizz.
arco

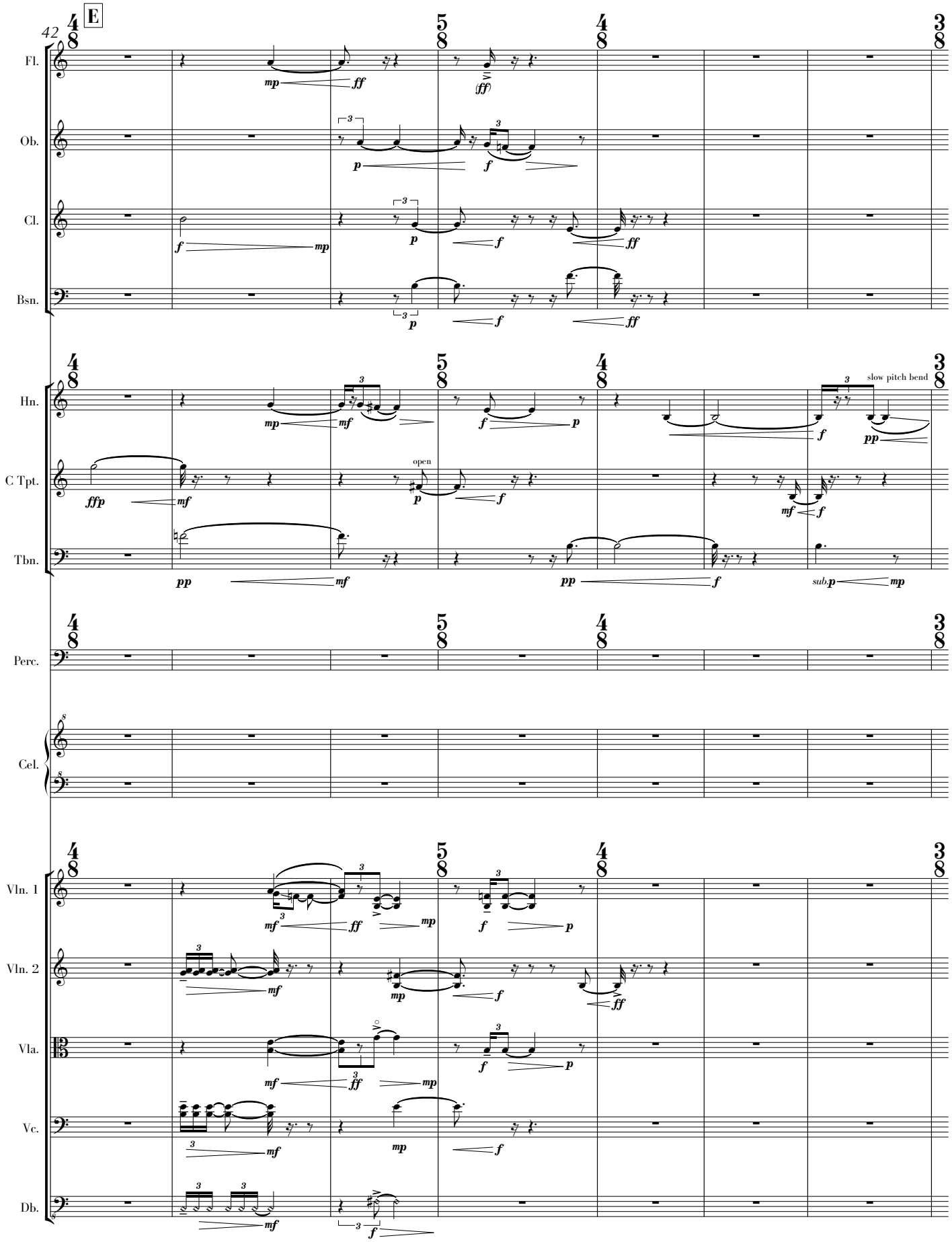

18
B
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
breathy
(ord.)
pizz.

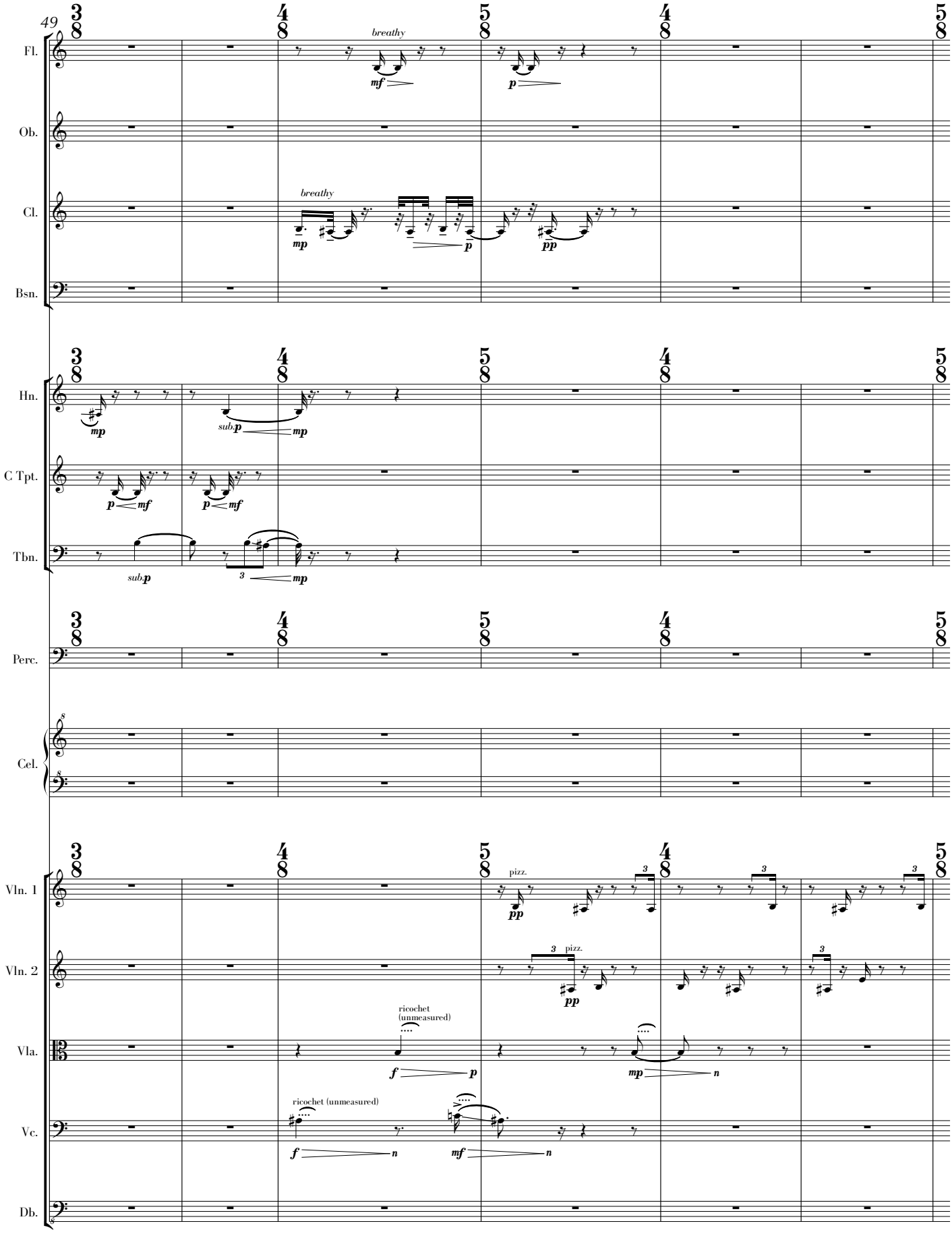

23
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
breathy
(ord.)
sub.
pizz.
arco
spiccato

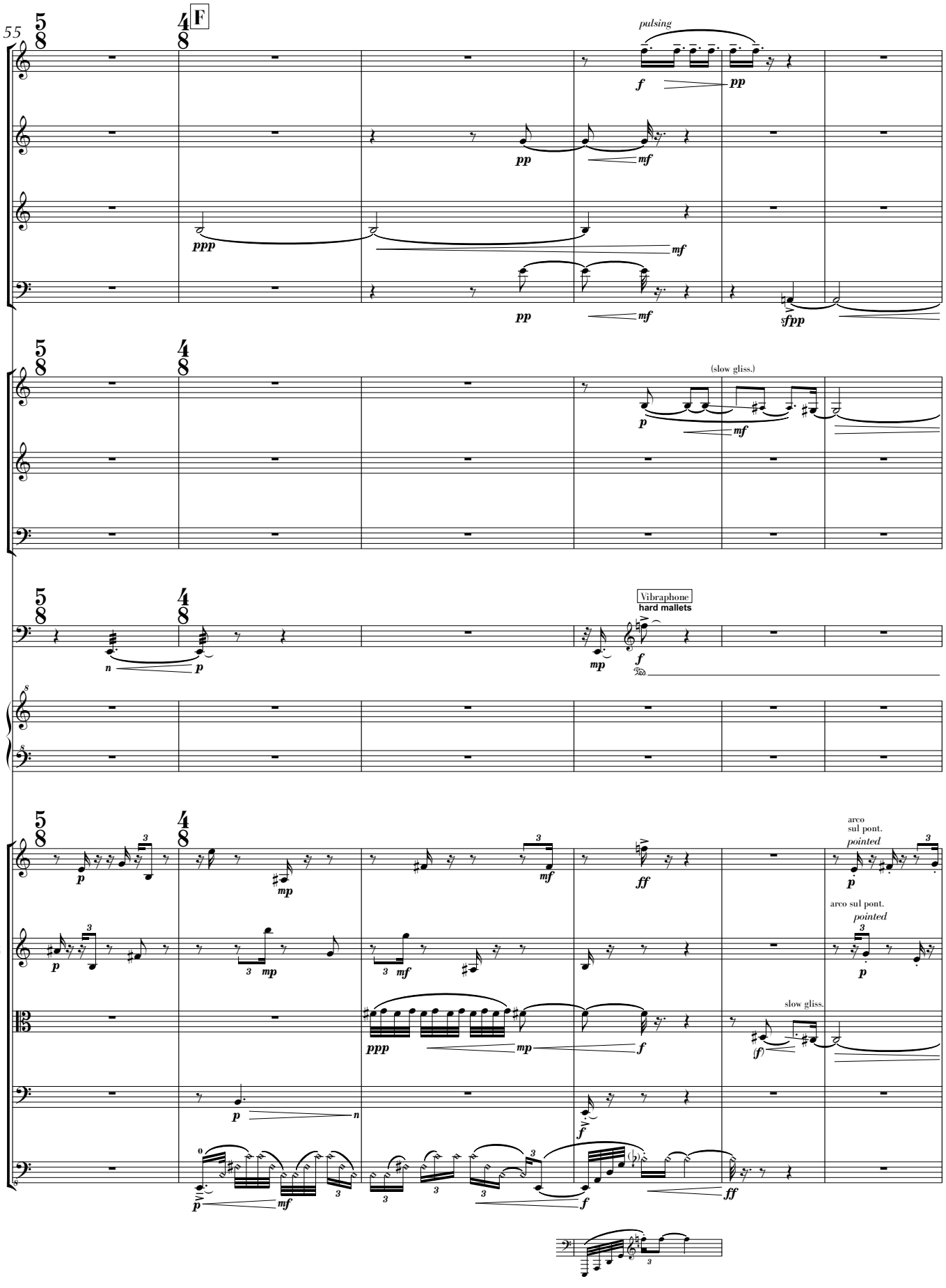

29
C
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
on beat
molto
straight mute
arco
arco, poco S.P.
arco sul pont.
ord.
poco S.P.
sul pont.

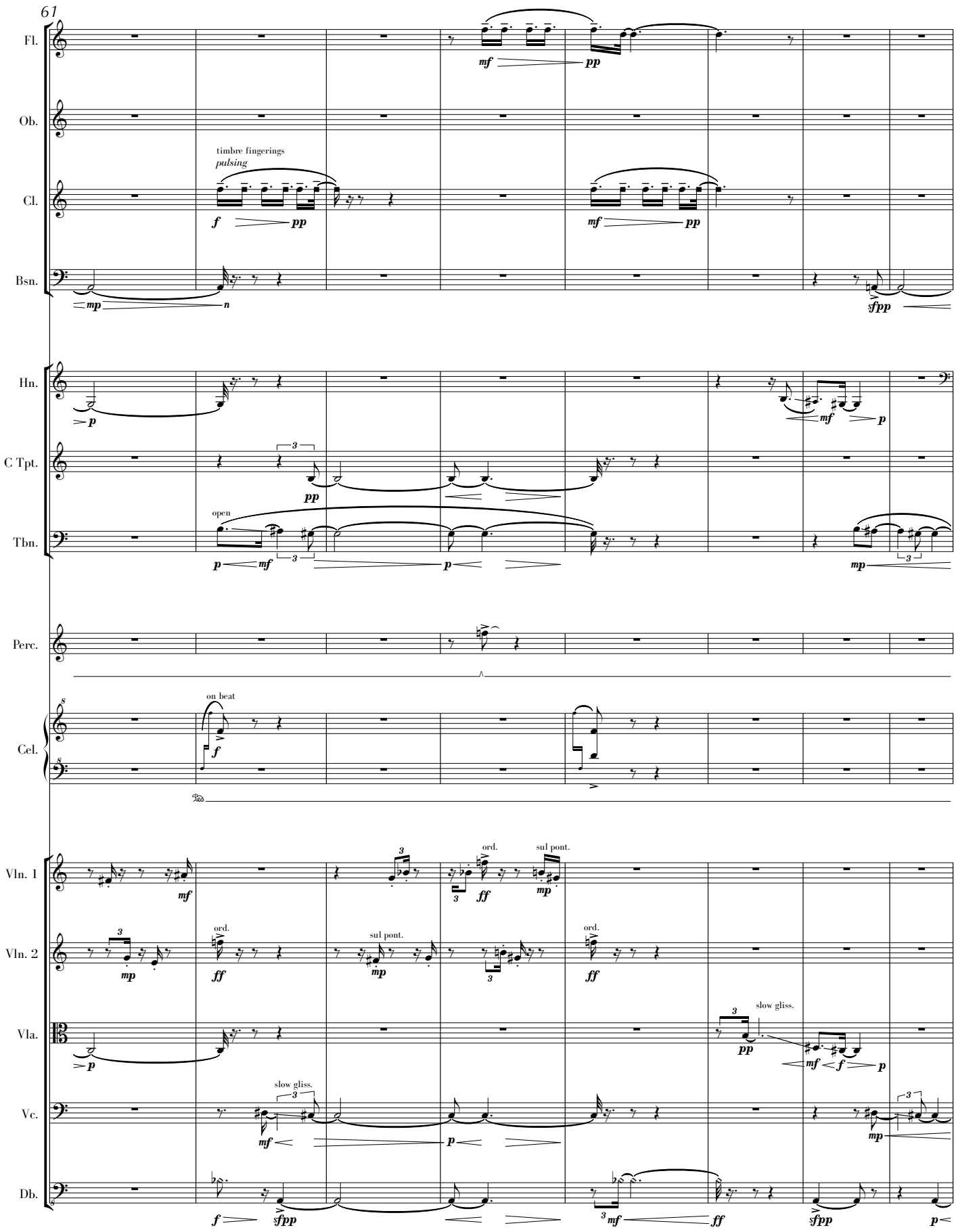

34
D
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
ord.
sul pont.
poco S.P.
sub.

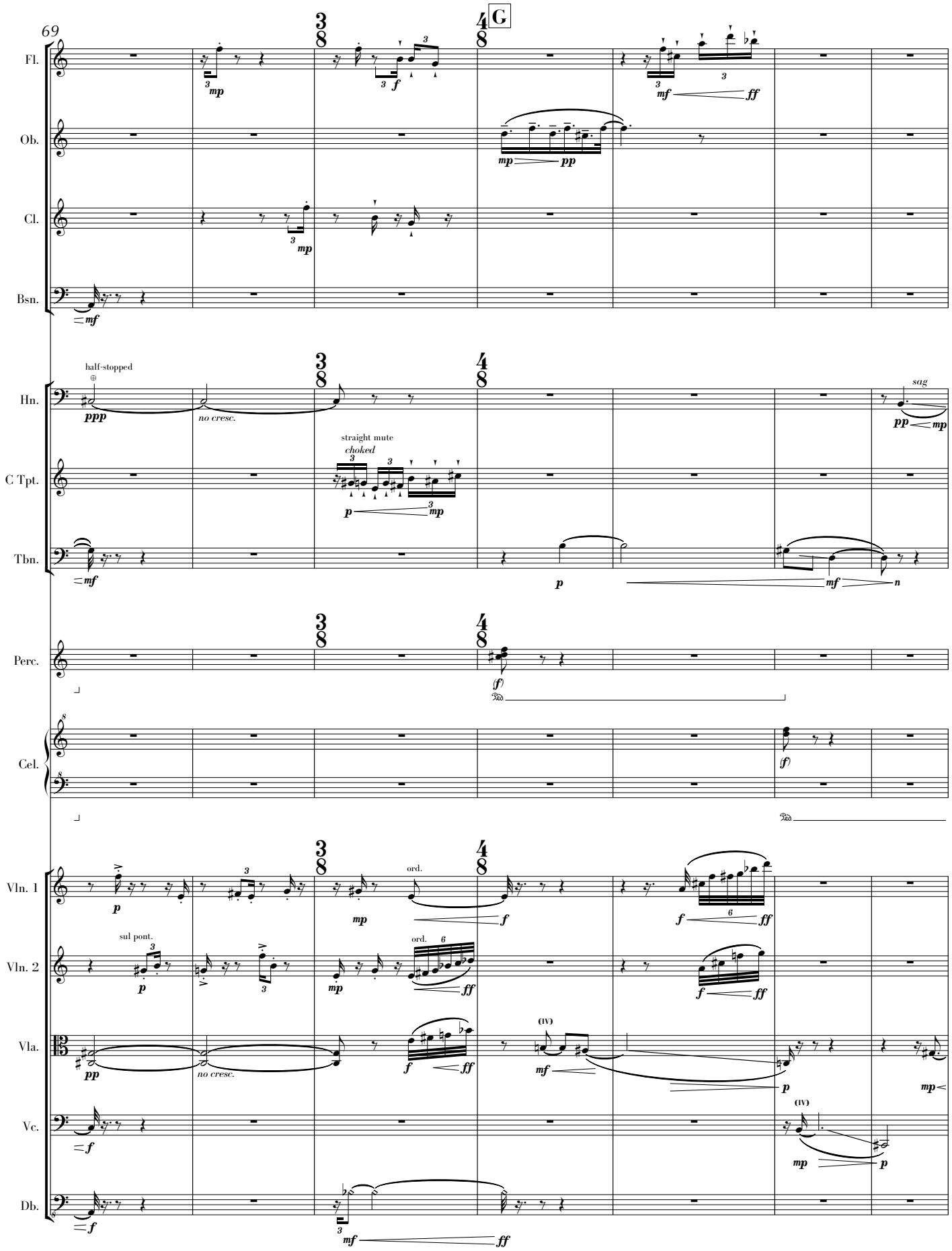

38
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
molto
poco S.P.
ord.
sul pont.
(cup mute)

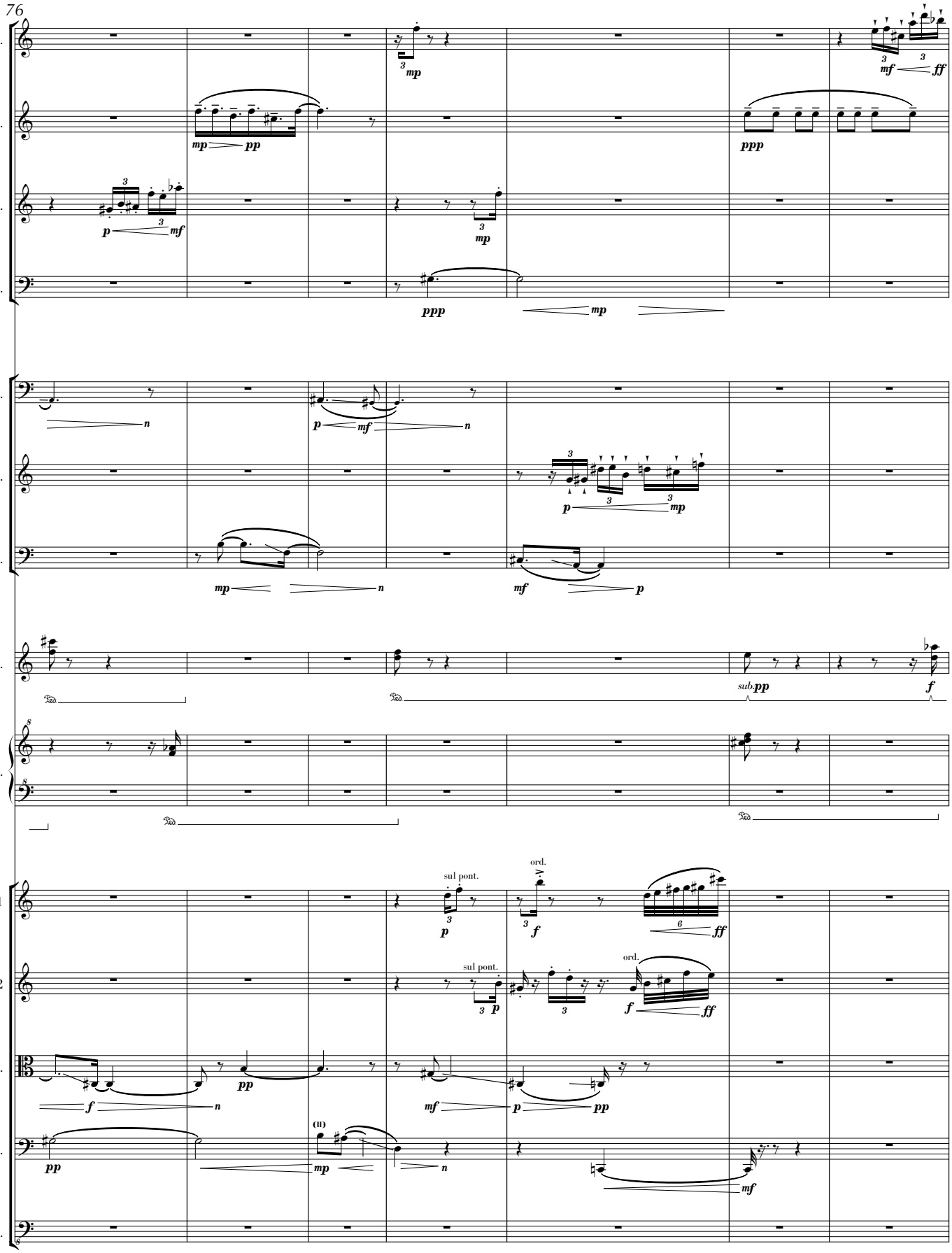

42
E
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
open
slow pitch bend

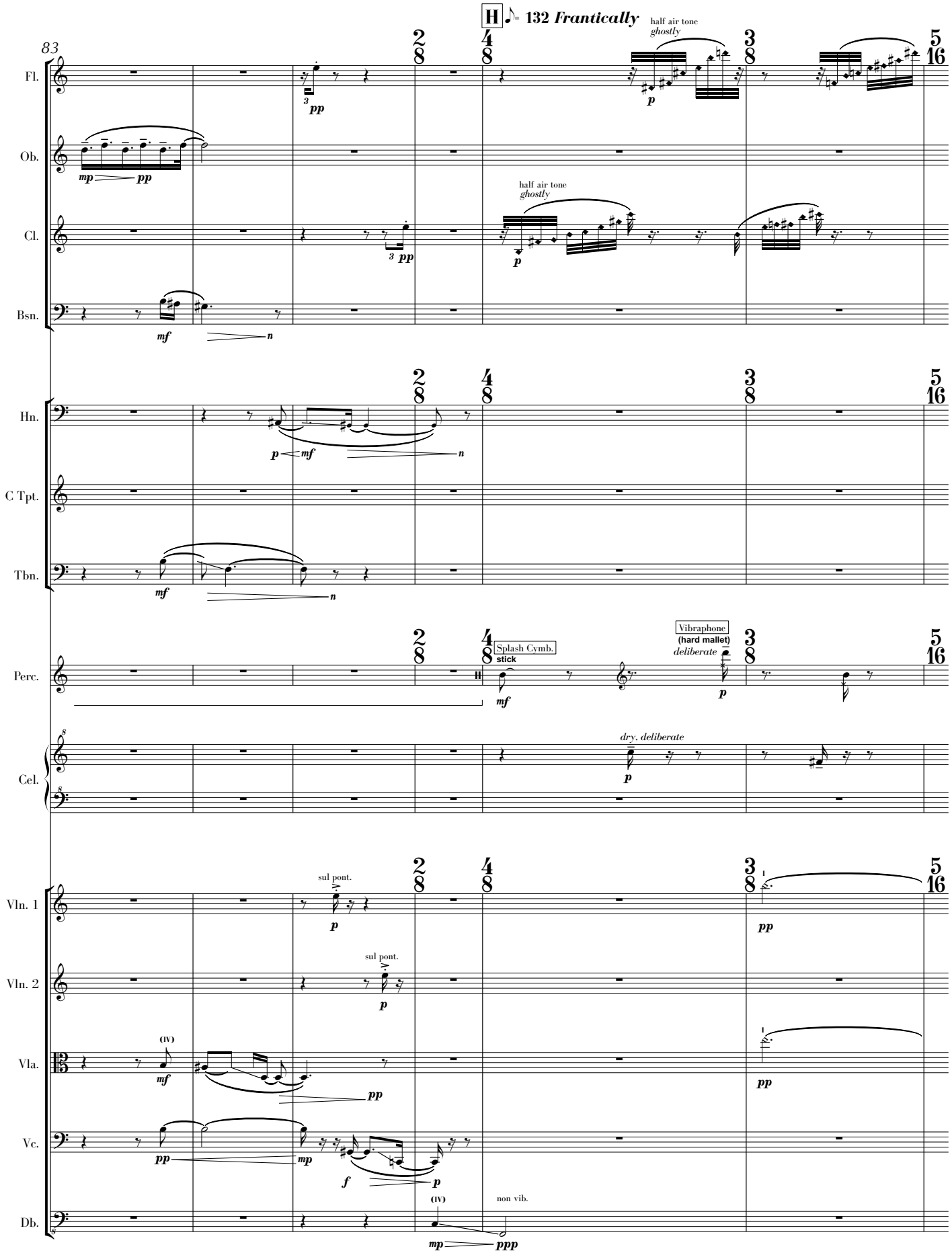

49
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
breathy
breathy
pizz.
pizz.
ricochet (unmeasured)
ricochet (unmeasured)

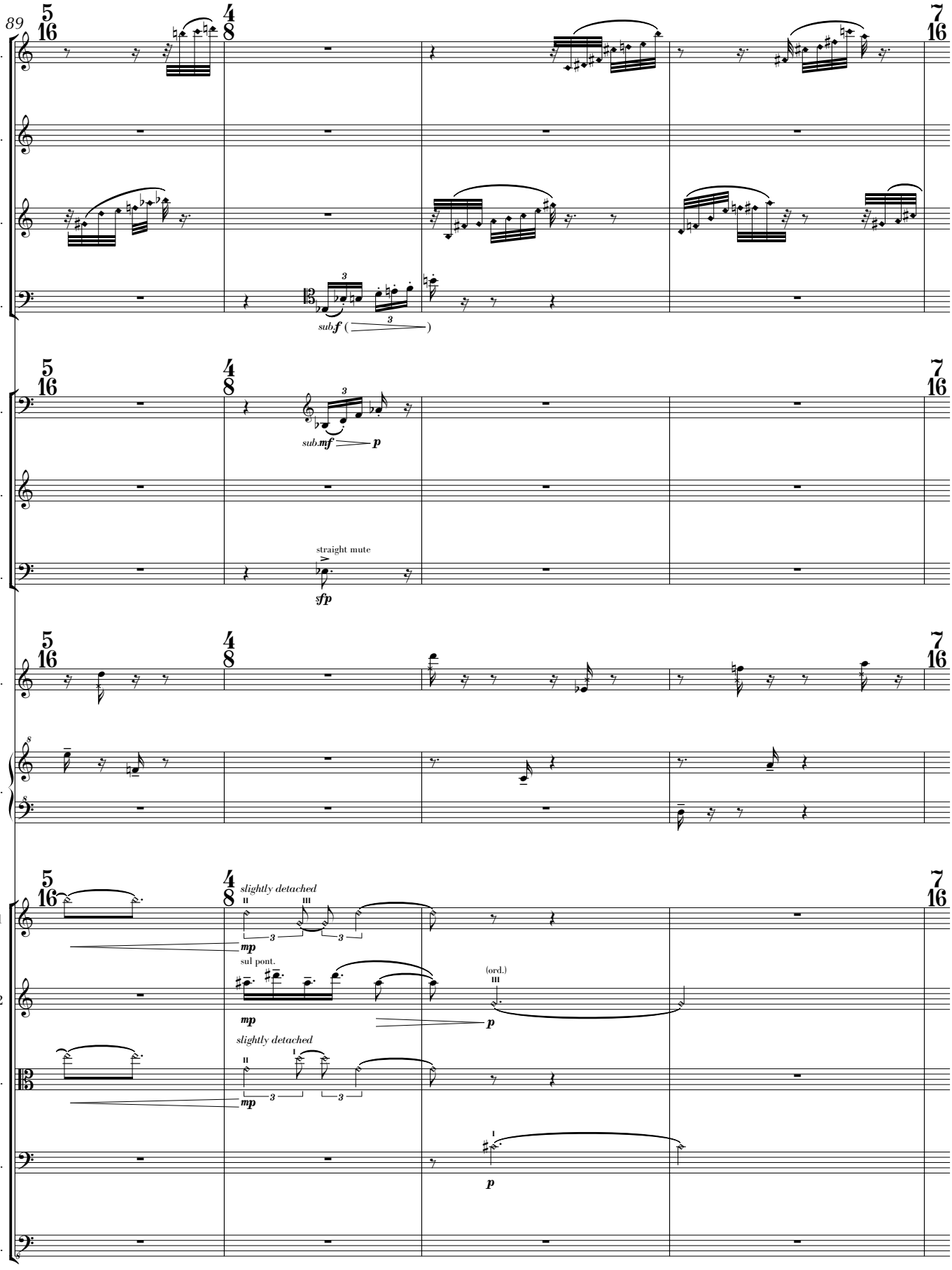

55
F
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Vibraphone
hard mallets
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
pulsing
(slow gliss.)
arco
sul pont.
pointed
slow gliss.

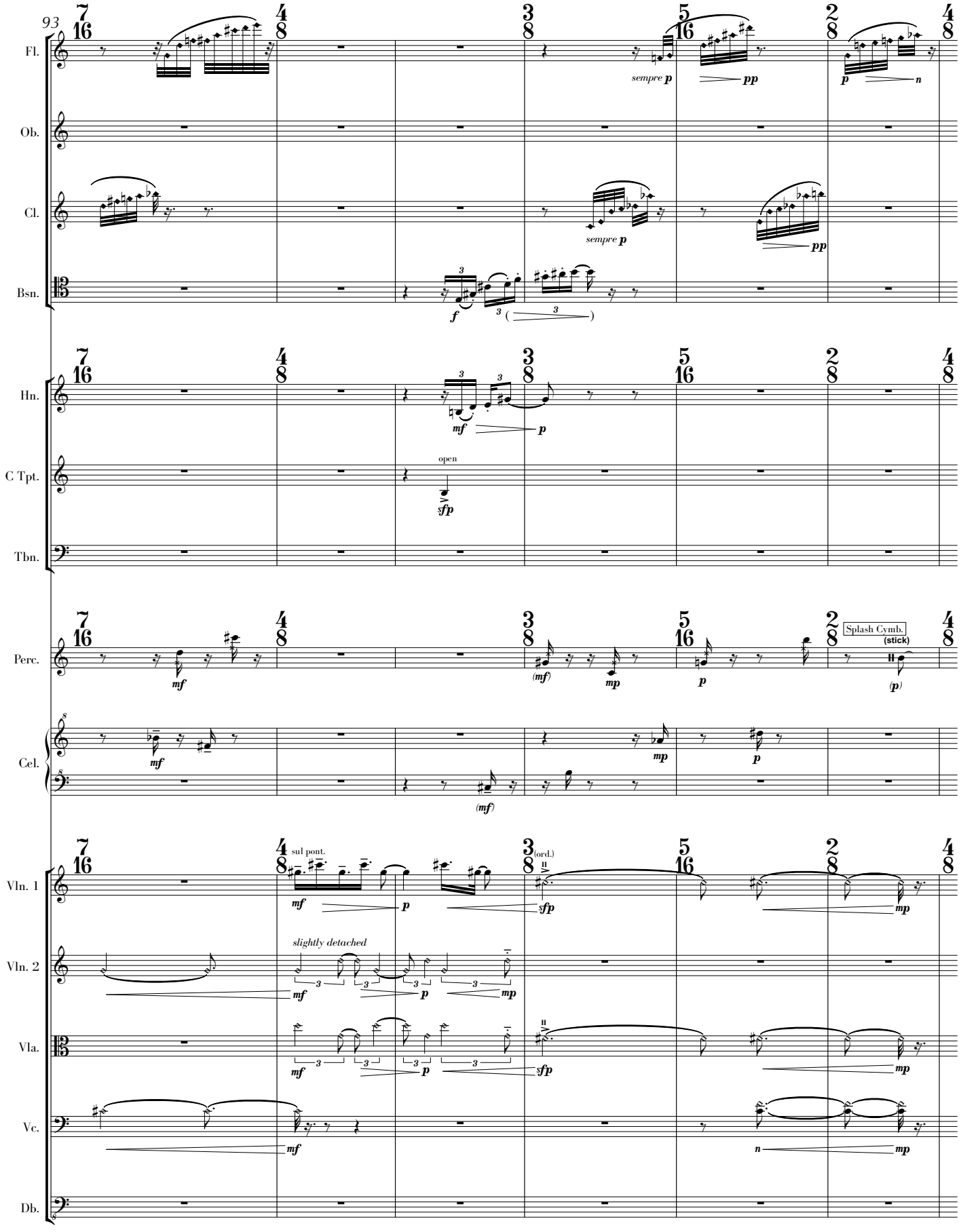

61
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
timbre fingerings
pulsing
open
on beat
ord.
sul pont.
slow gliss.

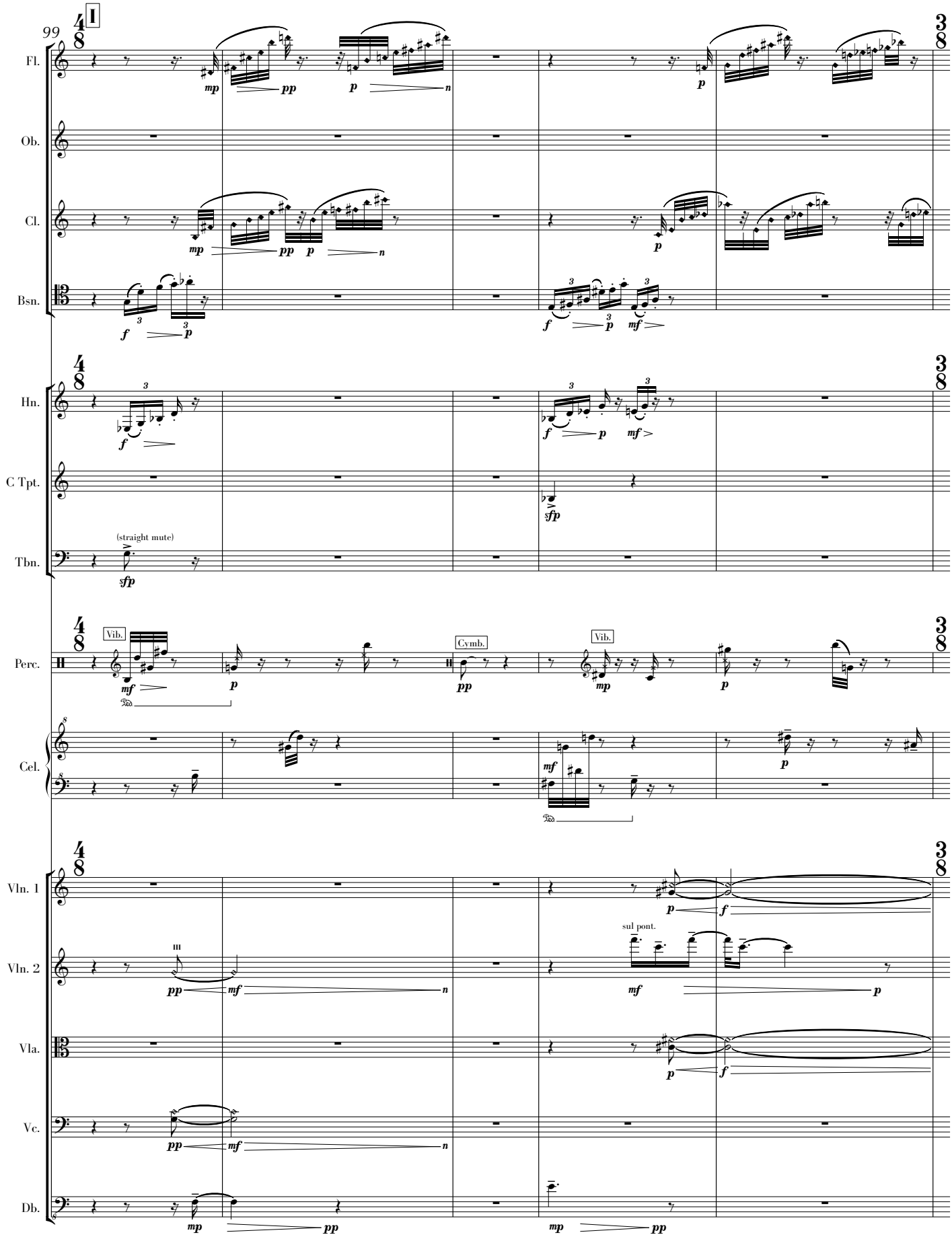

69
G
Fl.
Ob.
Cl.
Bsn.
Hn.
half-stopped
no cresc.
sag
C Tpt.
straight mute
choked
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
sul pont.
ord.
Vla.
no cresc.
(IV)
Vc.
Db.

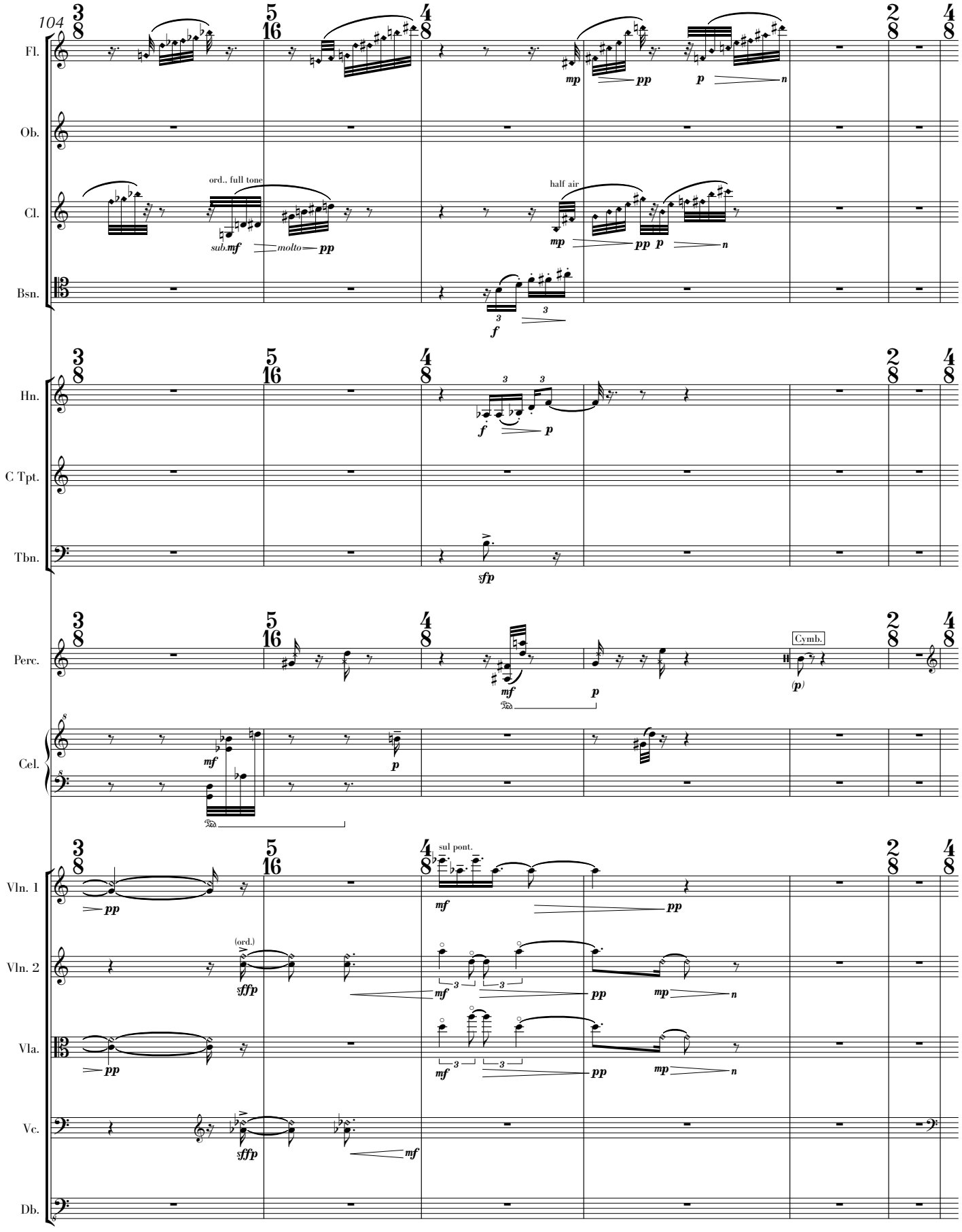

76
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
sul pont.
ord.
sub.pp

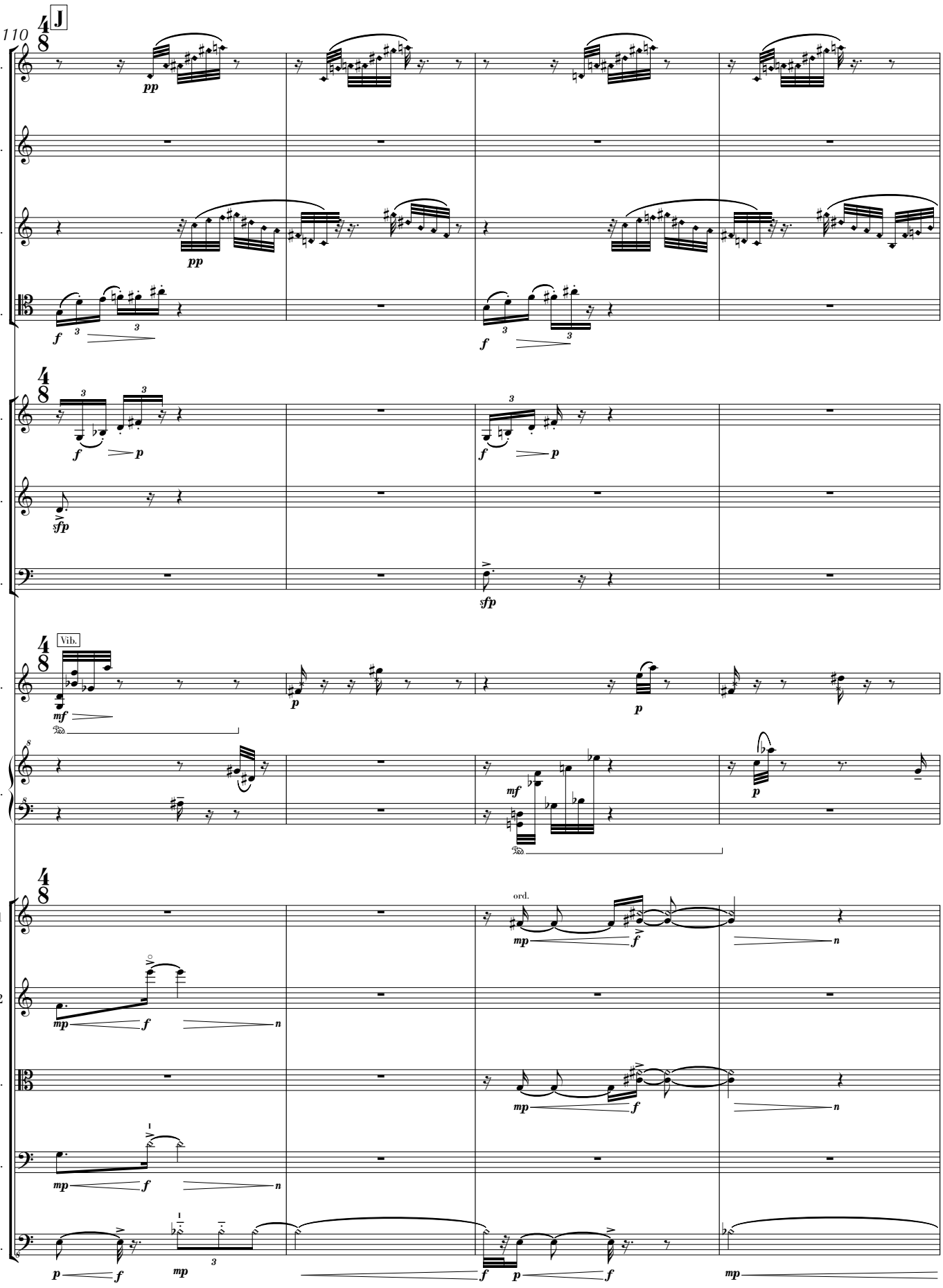

H
132 Frantically
83
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
half air tone
ghostly
Splash Cymb.
stick
Vibraphone
(hard mallet)
deliberate
dry, deliberate
sul pont.
non vib.

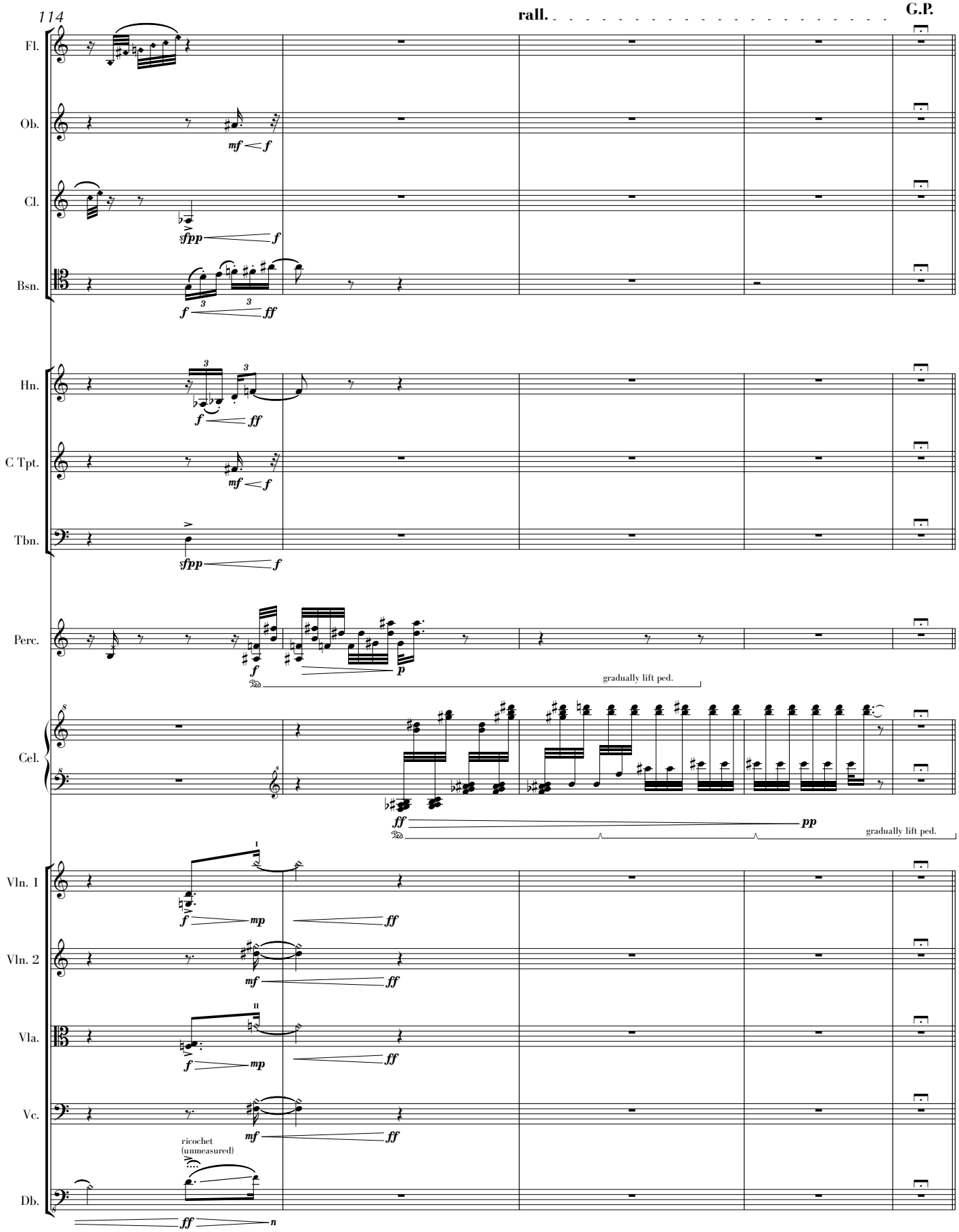

89
Fl.
Ob.
Cl.
Bsn.
sub.f
Hn.
sub.mf
p
C Tpt.
Tbn.
straight mute
sfp
Perc.
Cel.
Vln. 1
slightly detached
mp
Vln. 2
sul pont.
(ord.)
Vla.
Vc.
Db.

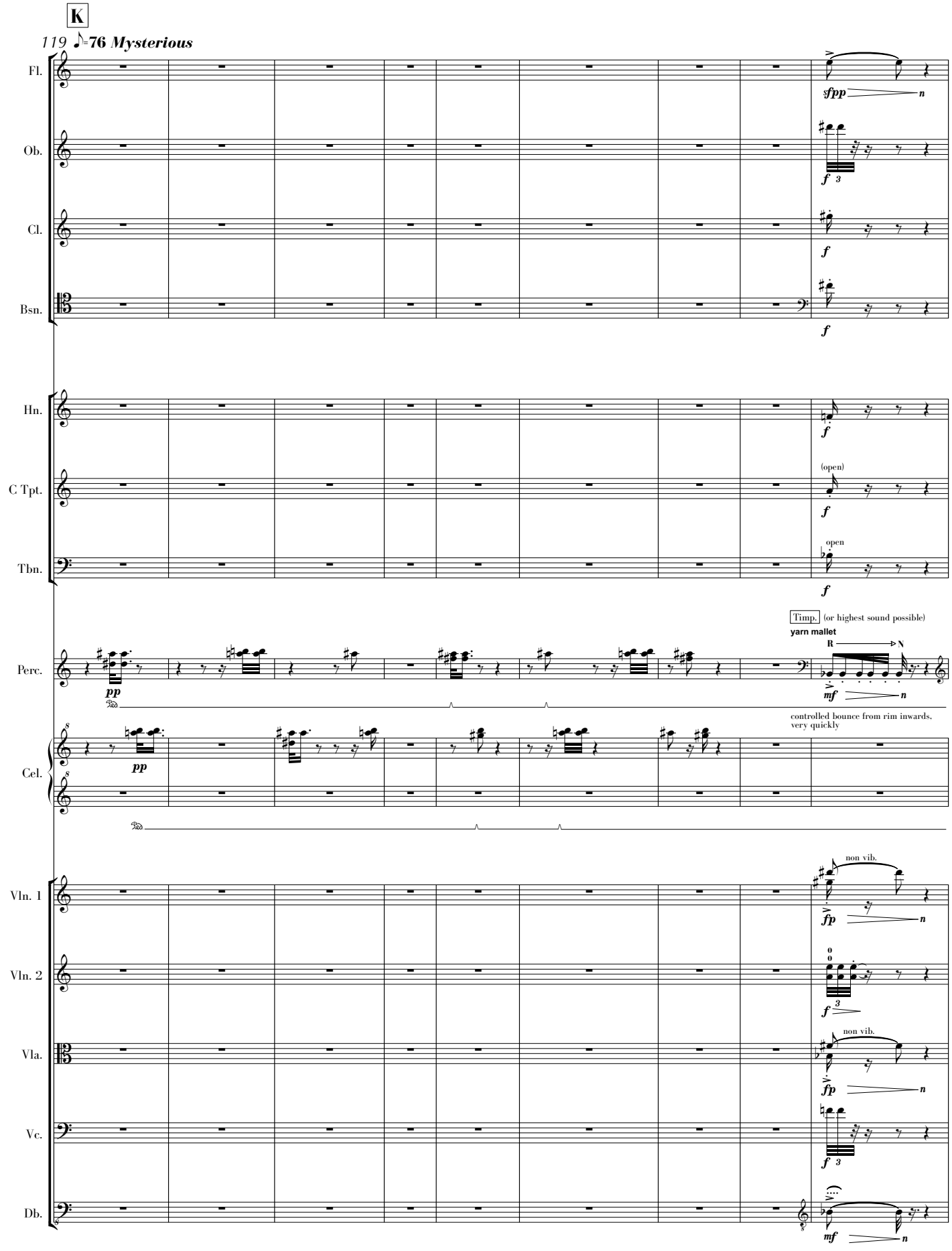

93
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
sempre p
pp
p
n
f
mf
open
sfp
(mf)
mp
Splash Cymb.
(stick)
(p)
sul pont.
(ord.)
slightly detached

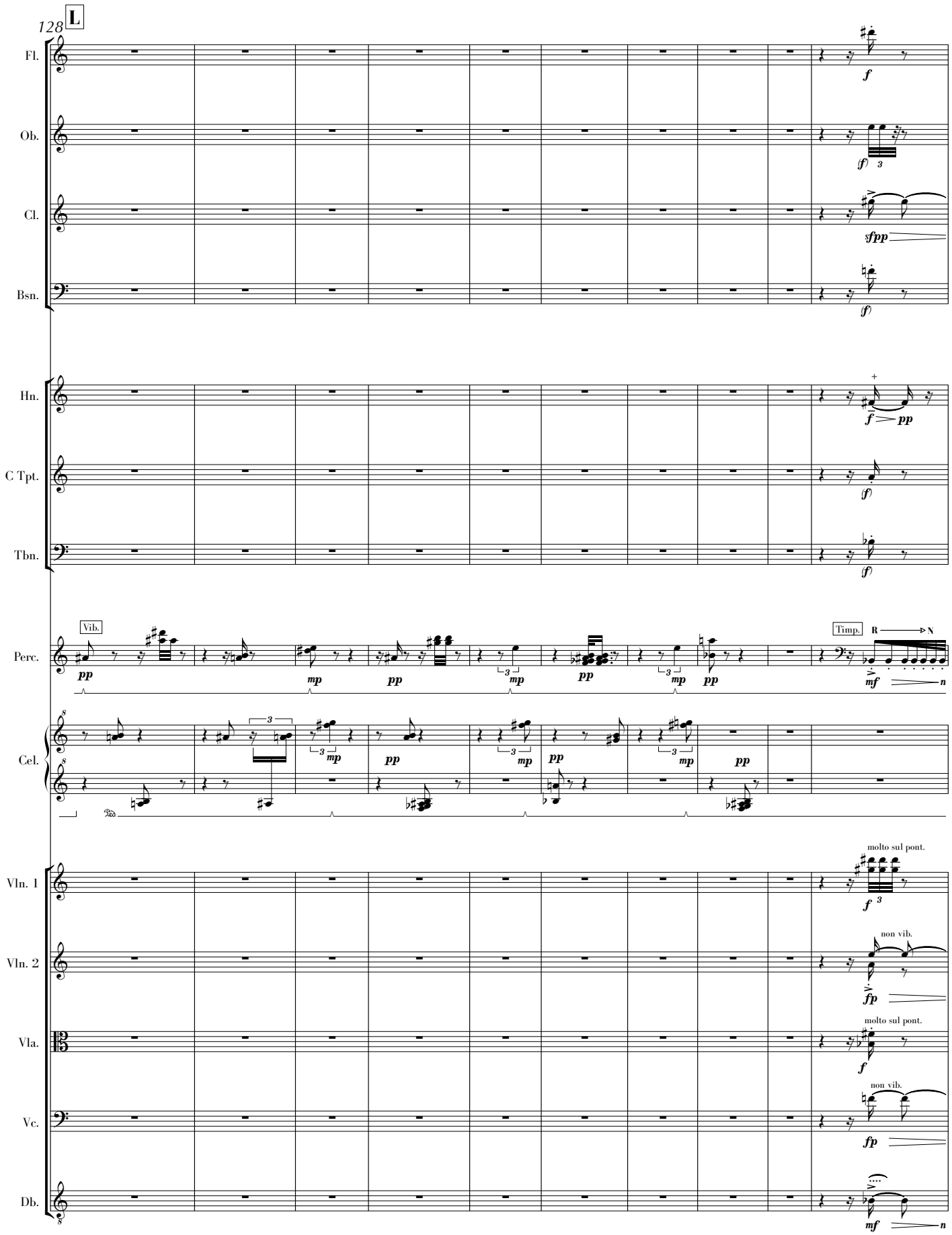

99
1
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
(straight mute)
Tbn.
Vib.
Cymb.
Vib.
Perc.
Cel.
Vln. 1
III
sul pont.
Vln. 2
Vla.
Vc.
Db.

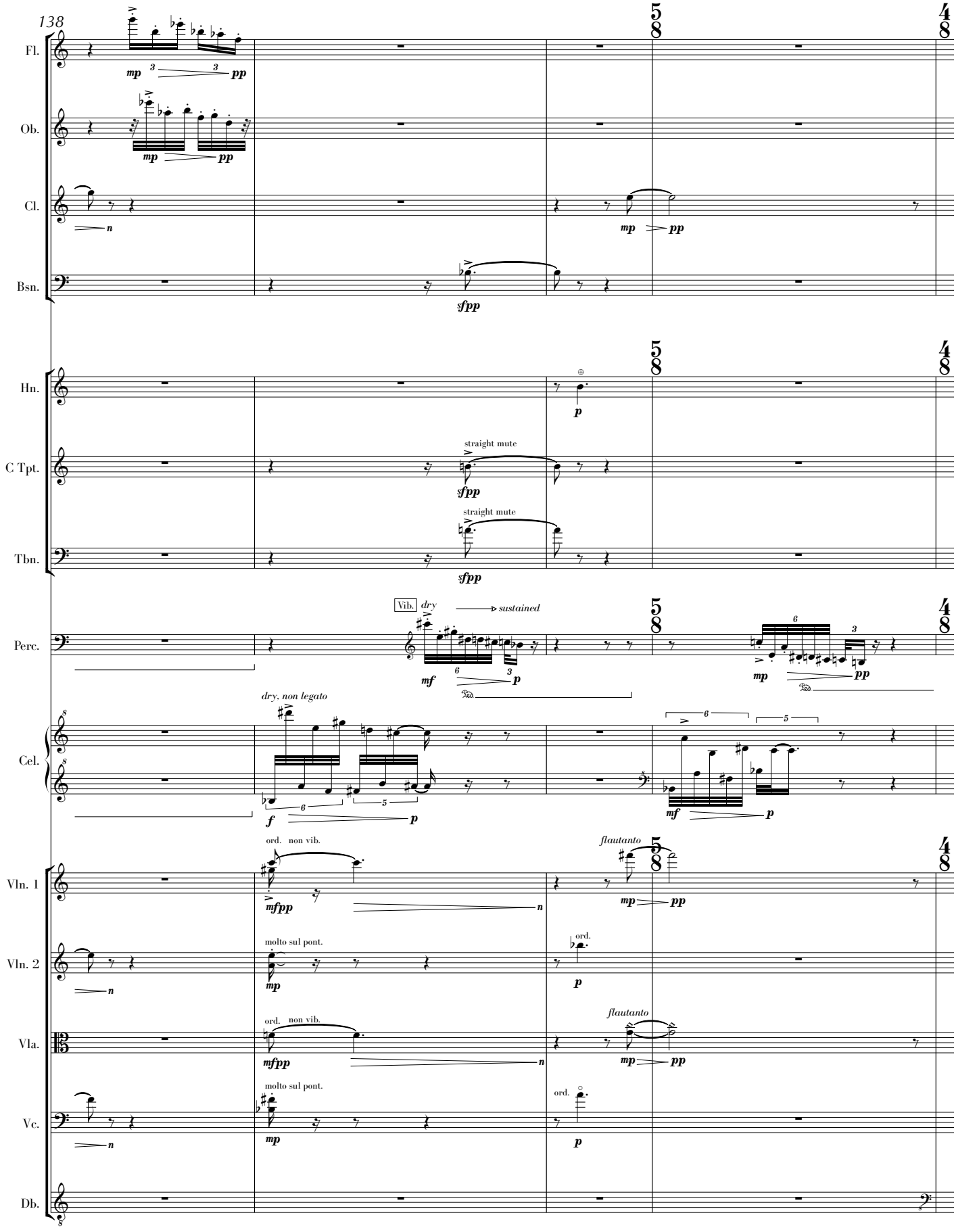

104
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
ord., full tone
half air
sul pont.
(ord.)
Cymb.

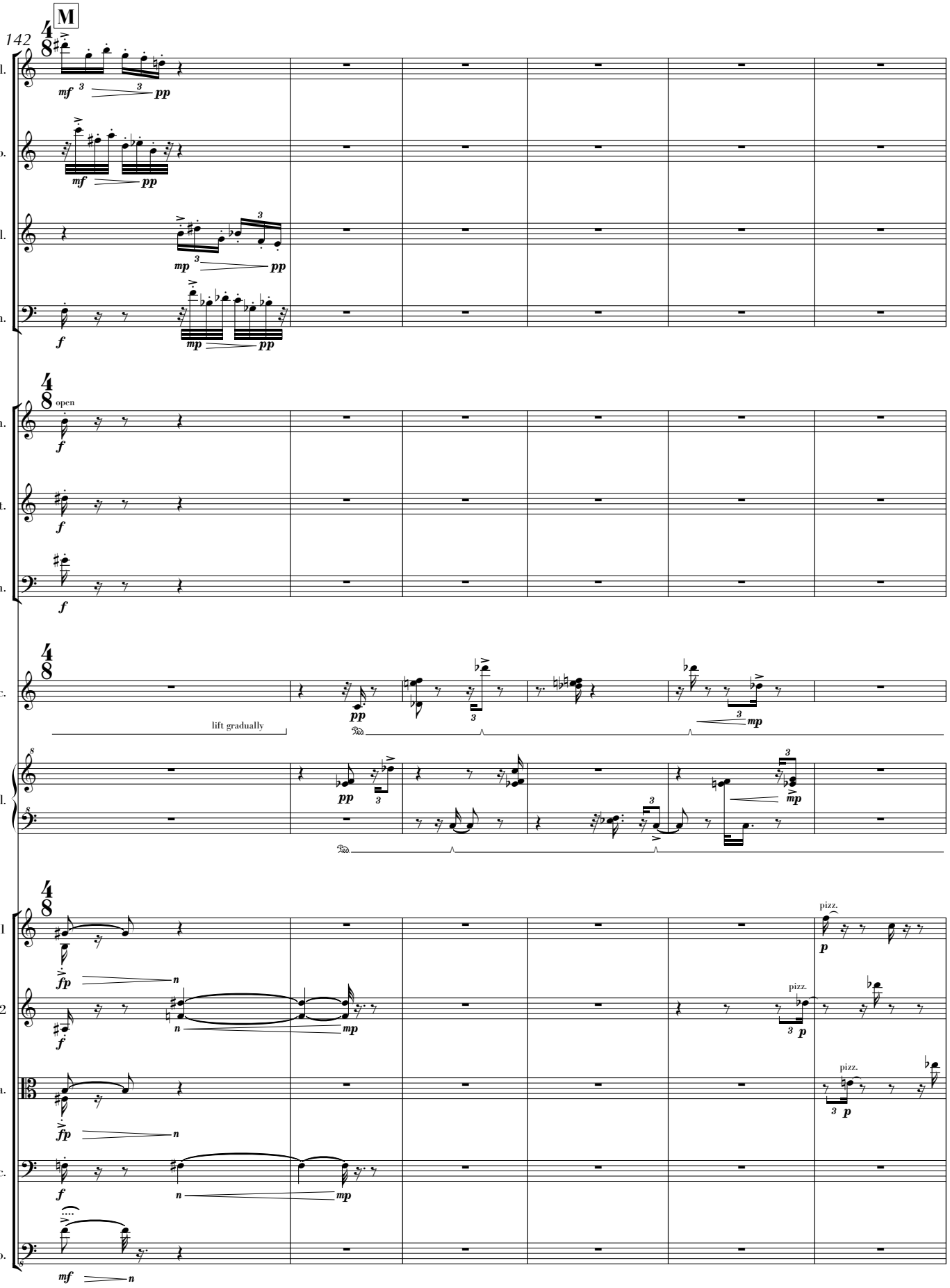

110
J
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Vib.
Perc.
Cel.
ord.
Vln. 1
Vln. 2
Vla.
Vc.
Db.

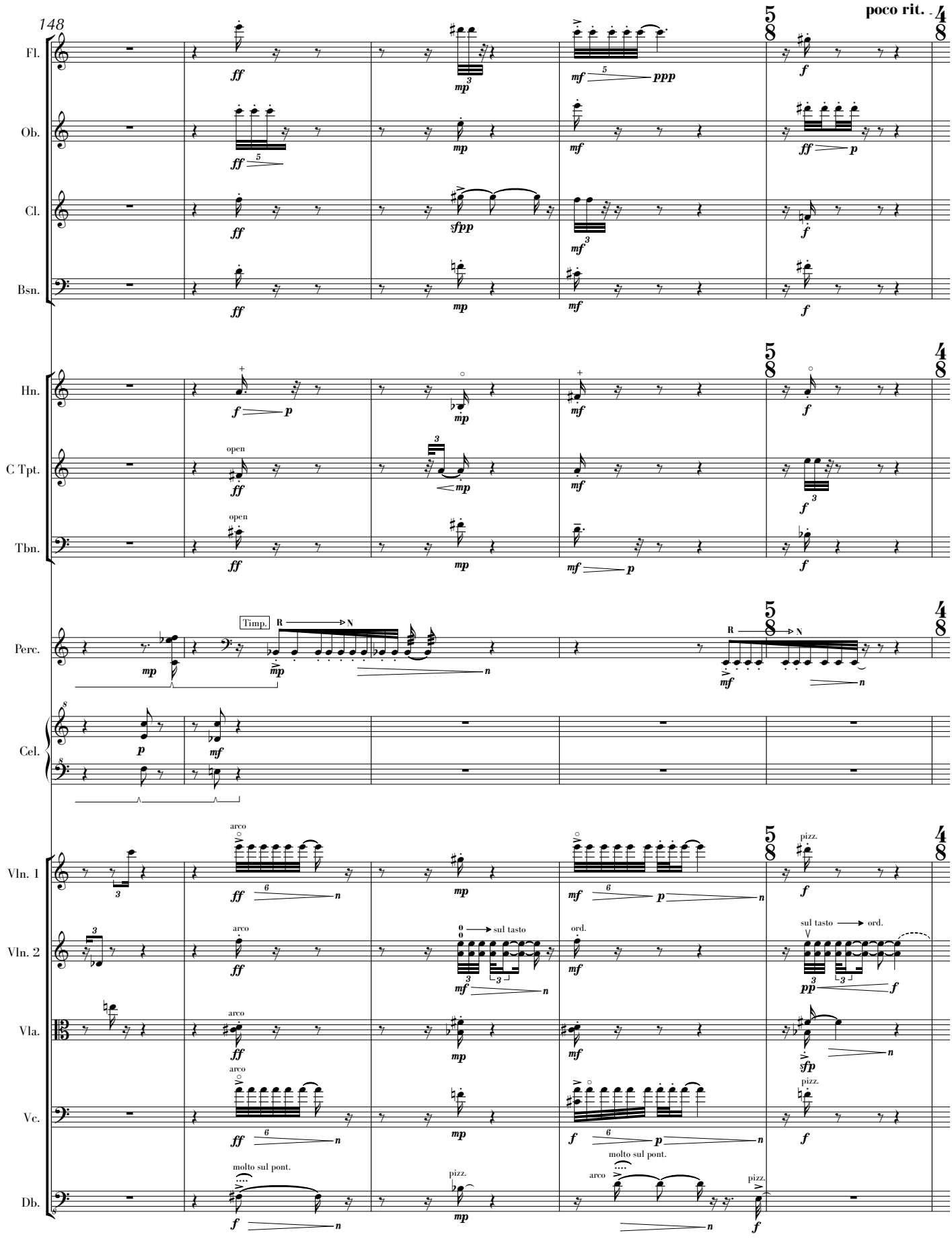

114
rall.
G.P.
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
gradually lift ped.
gradually lift ped.
ricochet
(unmeasured)

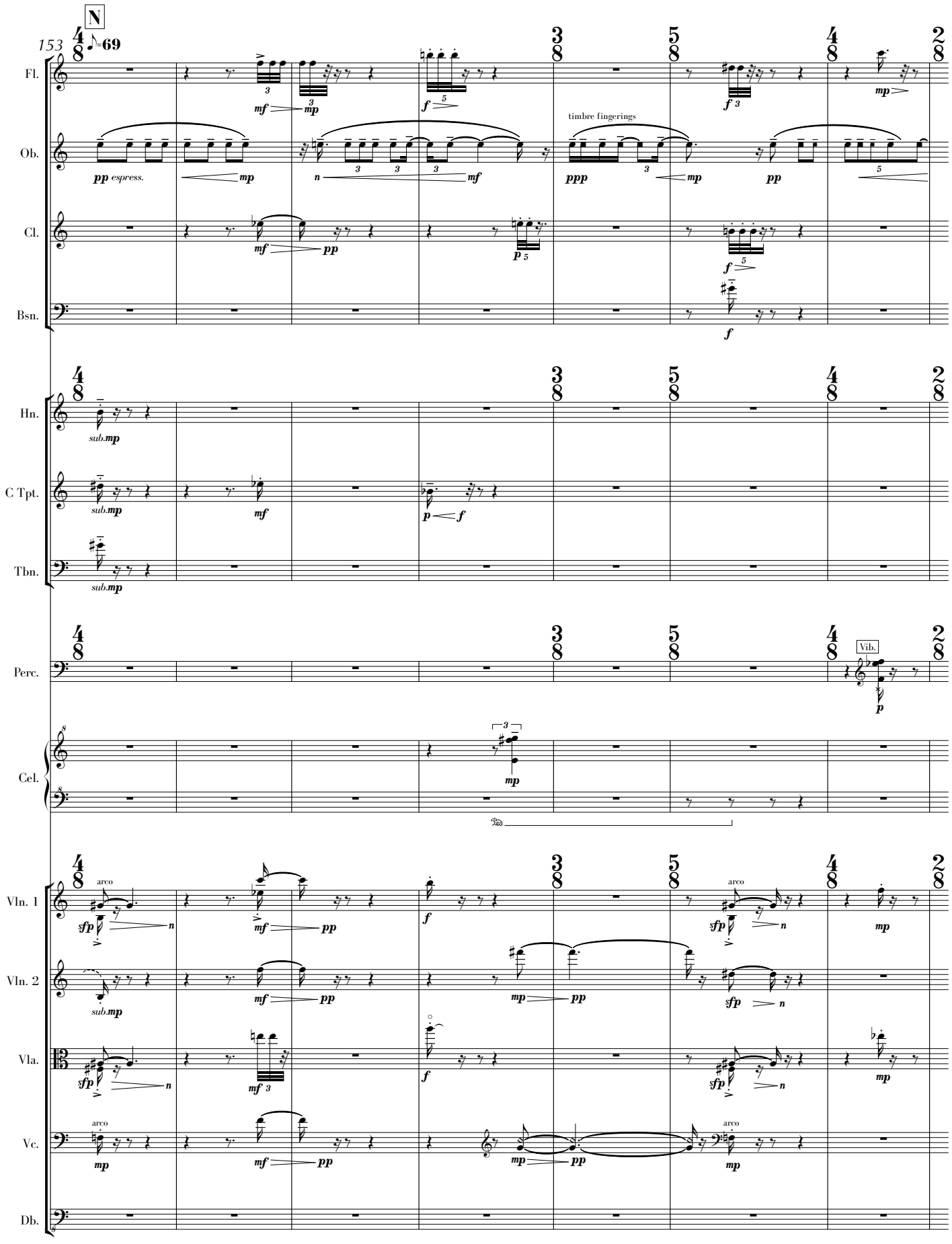

K
119 ♪=76 Mysterious
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
(open)
Tbn.
open
Timp. (or highest sound possible)
yarn mallet
Perc.
Cel.
controlled bounce from rim inwards, very quickly
Vln. 1
non vib.
Vln. 2
Vla.
non vib.
Vc.
Db.

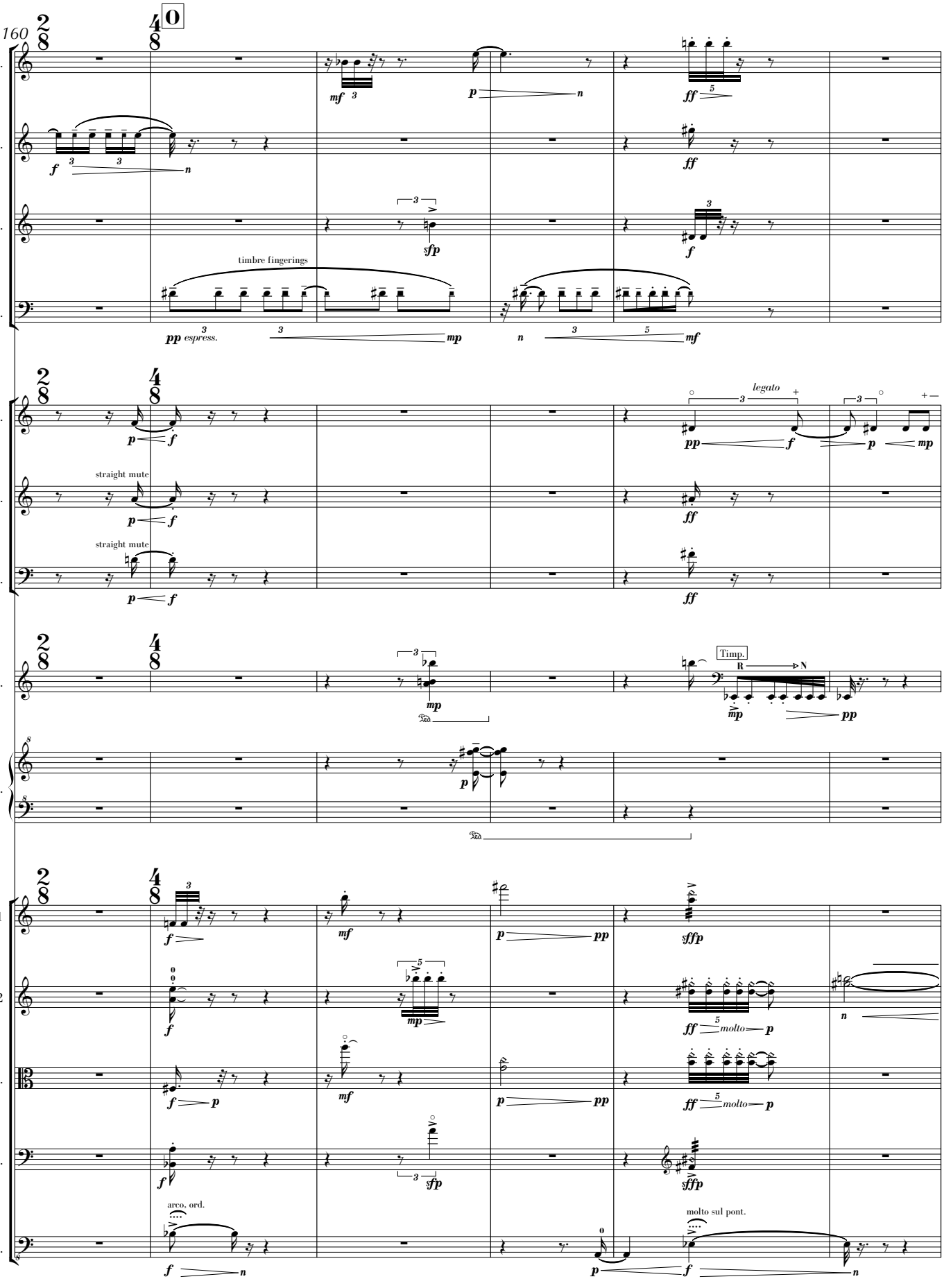

128
L
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Vib.
Timp.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
molto sul pont.
non vib.
molto sul pont.
non vib.

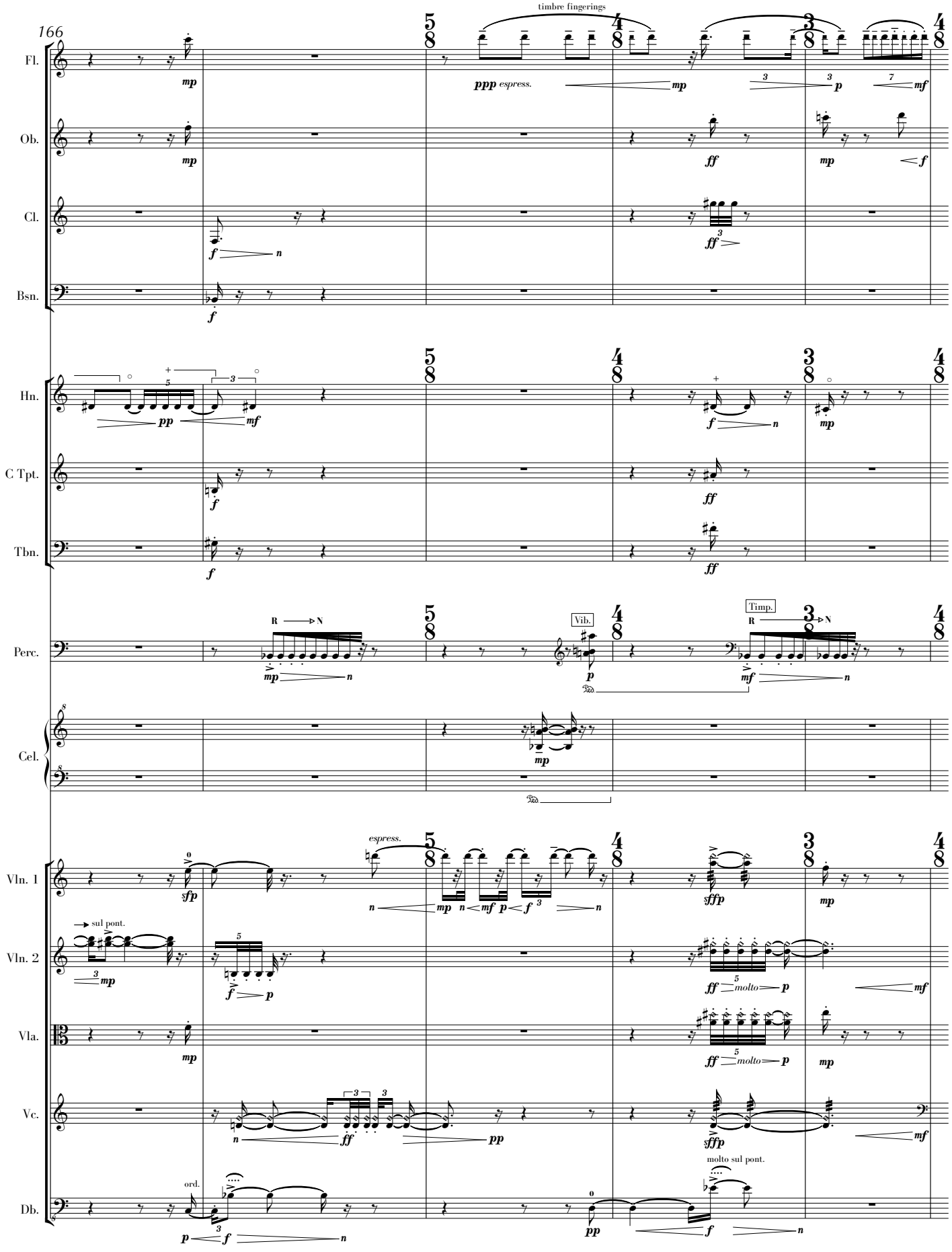

138
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
straight mute
Tbn.
straight mute
Perc.
Vib.
dry
sustained
Cel.
dry, non legato
Vln. 1
ord.
non vib.
flautanto
Vln. 2
molto sul pont.
ord.
Vla.
ord.
non vib.
flautanto
Vc.
molto sul pont.
ord.
Db.

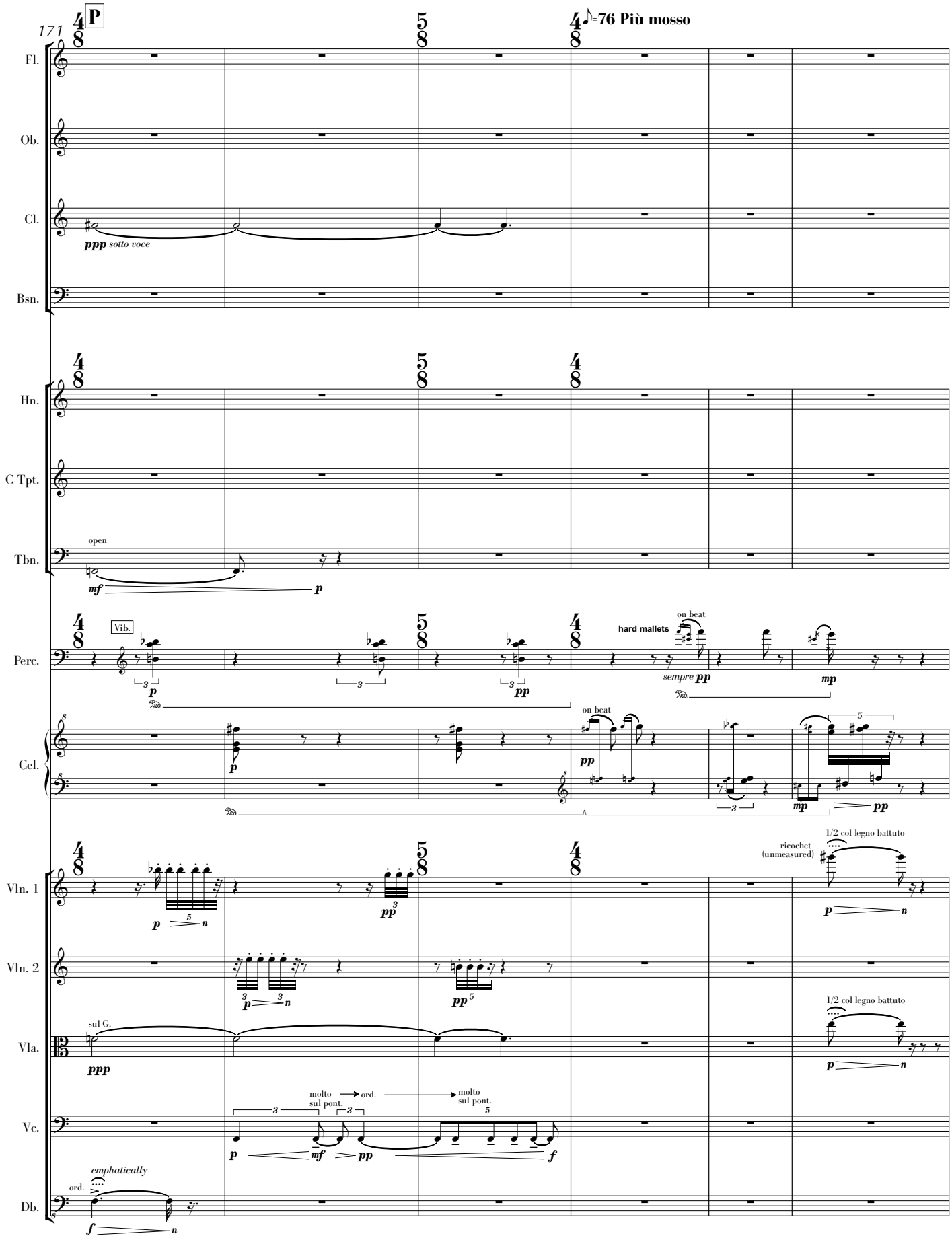

M
142
Fl.
Ob.
Cl.
Bsn.
Hn.
open
C Tpt.
Tbn.
Perc.
lift gradually
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
pizz.

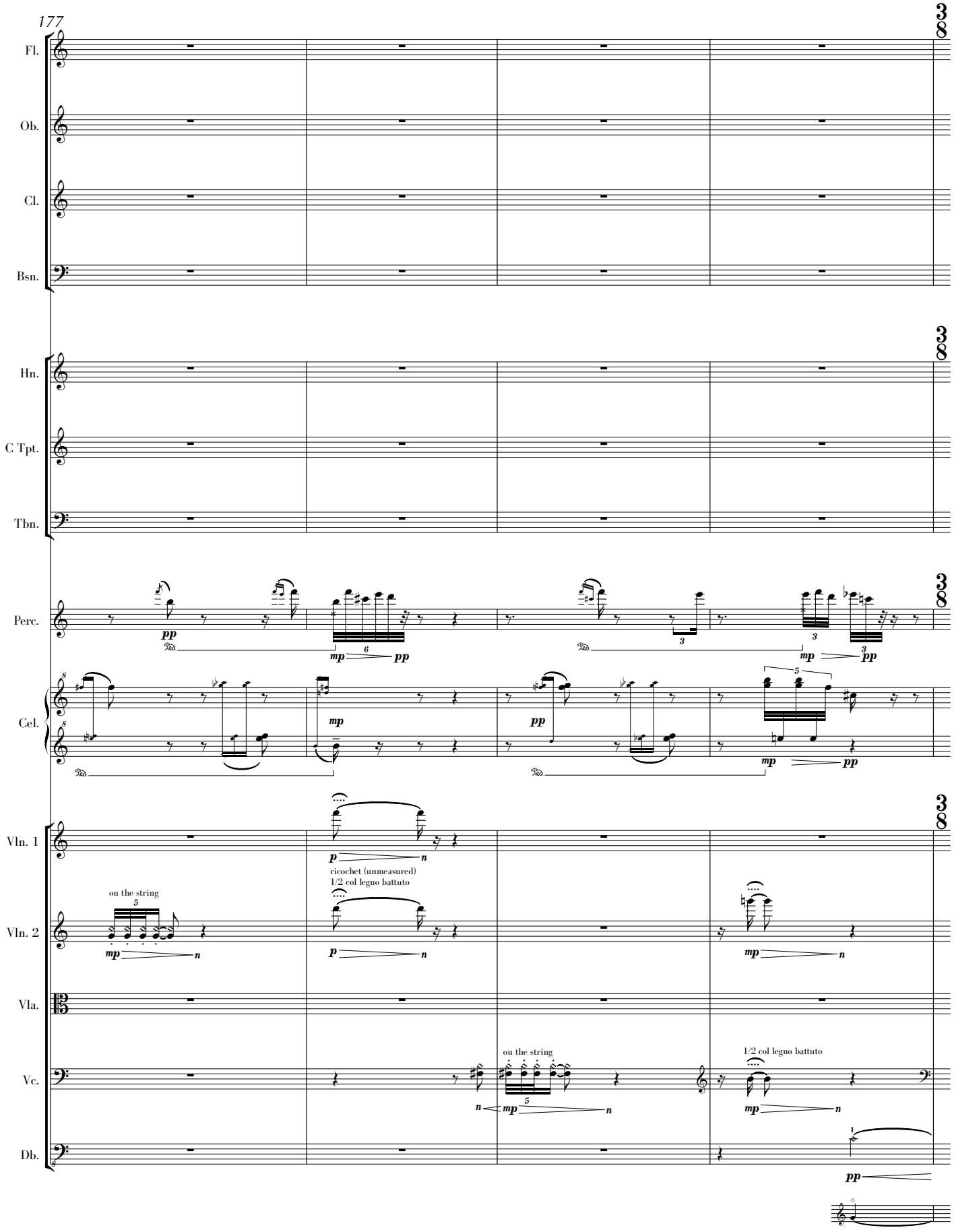

148
poco rit.
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Timp.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
arco
ord.
sul tasto
pizz.
molto sul pont.
open

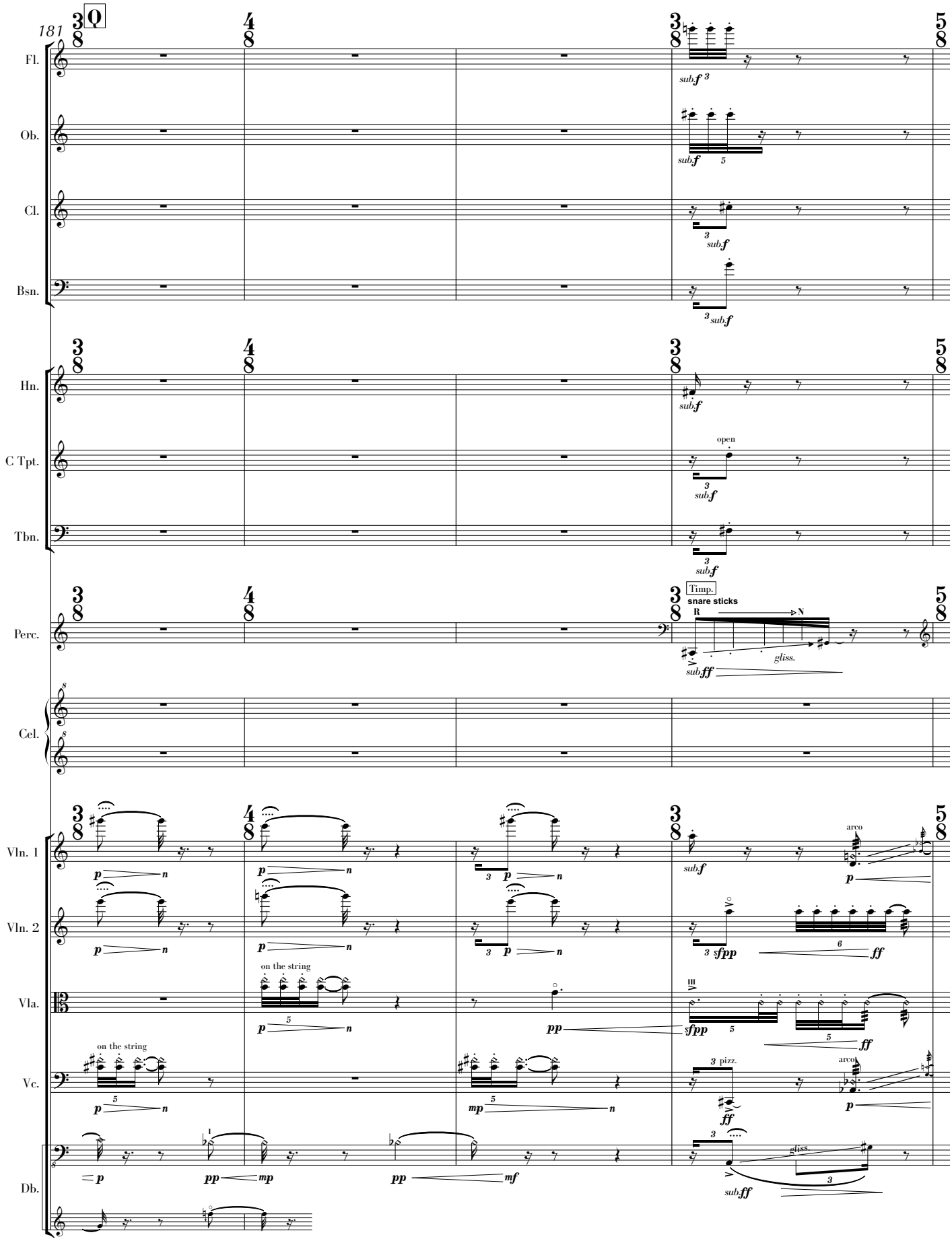

N
153
♪=69
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Vib.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
timbre fingerings
arco

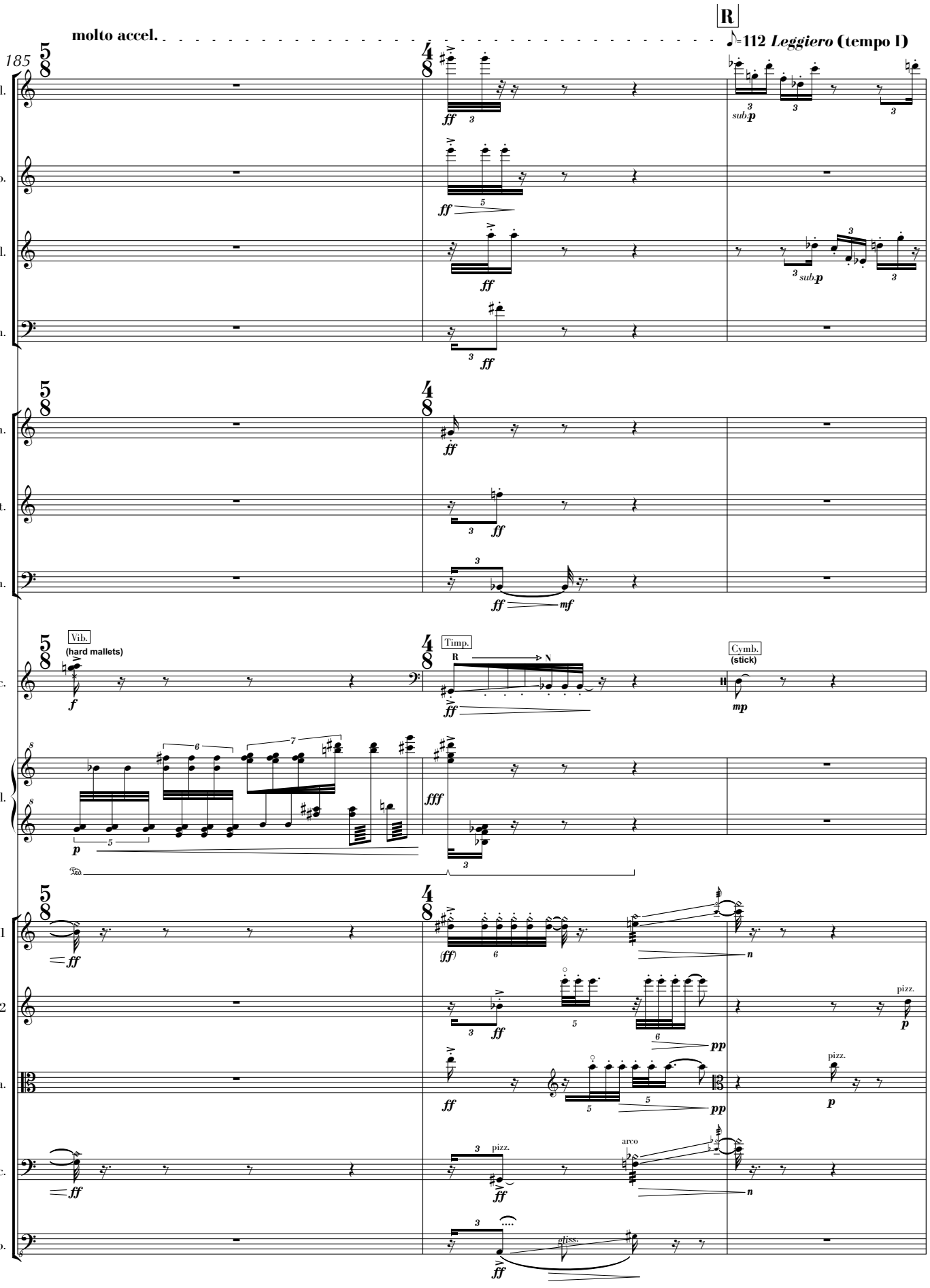

160
O
Fl.
Ob.
Cl.
Bsn.
timbre fingerings
Hn.
C Tpt.
straight mute
Tbn.
straight mute
legato
Perc.
Timp.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
arco, ord.
molto sul pont.
molto
molto

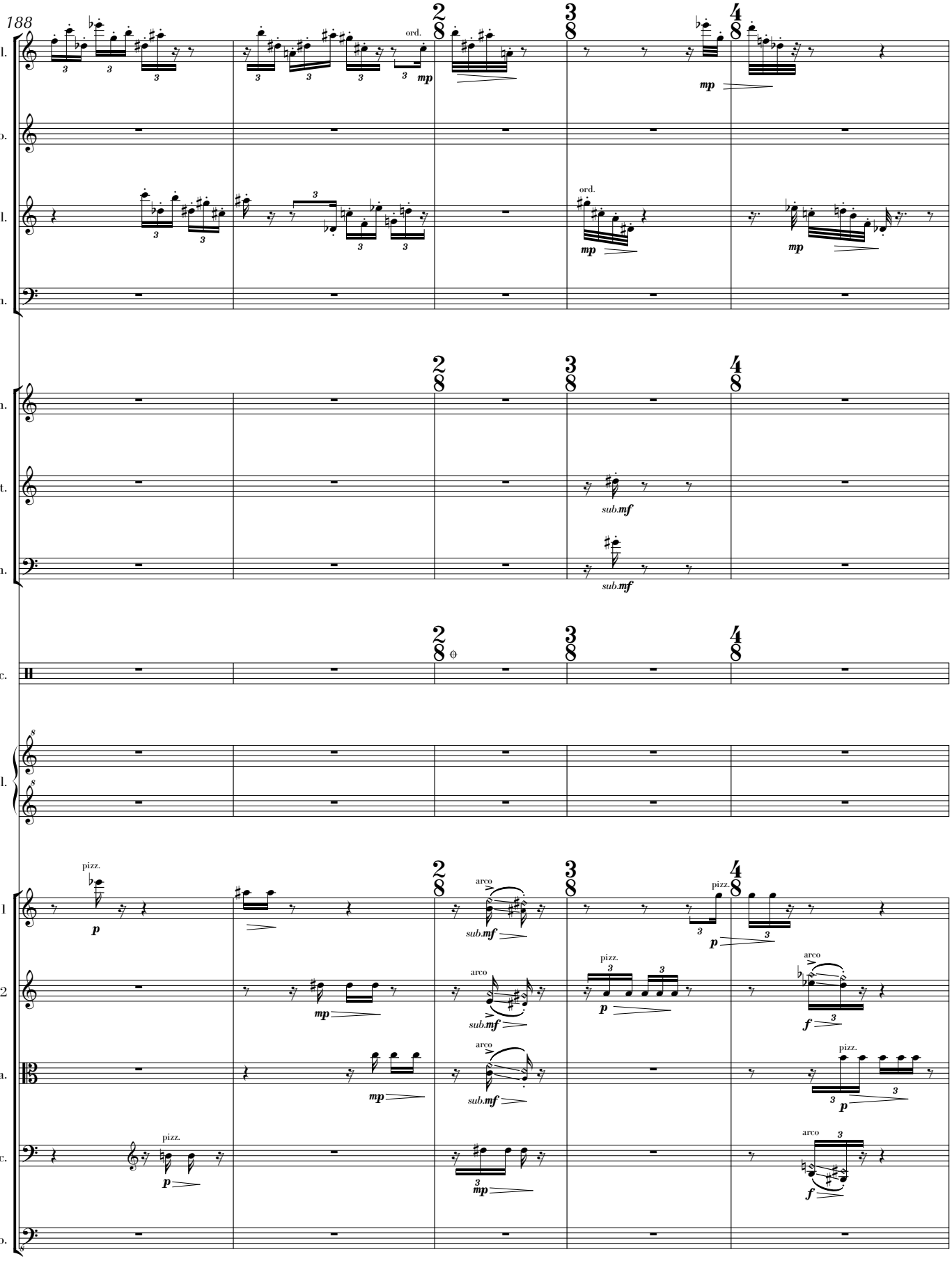

166
timbre fingerings
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
R
N
Vib.
Timp.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
espress.
sul pont.
molto
ord.
molto sul pont.

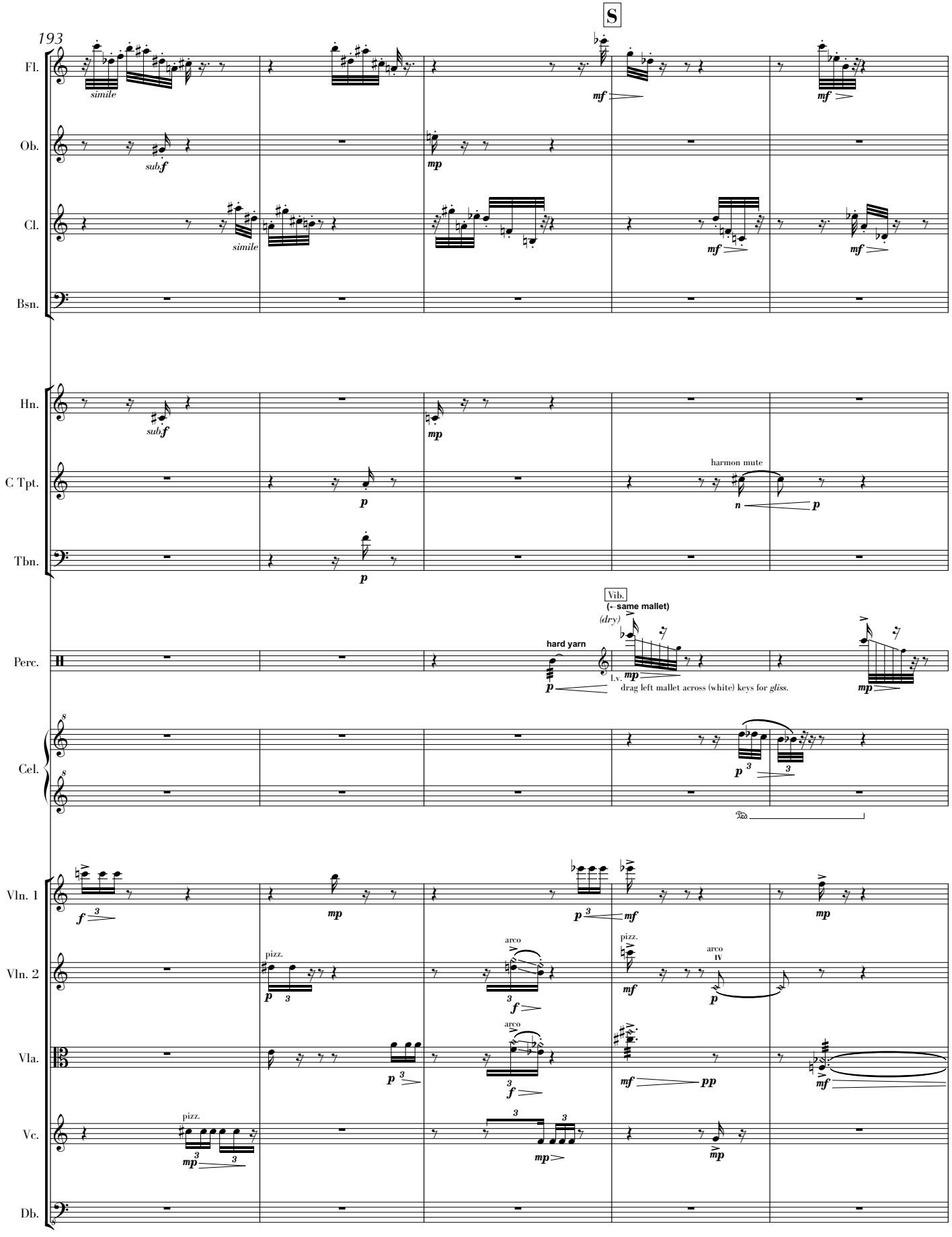

171
P
♩=76 Più mosso
Fl.
Ob.
Cl.
ppp sotto voce
Bsn.
Hn.
C Tpt.
Tbn.
open
mf
p
Perc.
Vib.
hard mallets
on beat
sempre pp
mp
Cel.
pp
Vln. 1
Vln. 2
Vla.
sul G.
ppp
Vc.
molto sul pont.
ord.
molto sul pont.
Db.
emphatically
ricochet (unmeasured)
1/2 col legno battuto

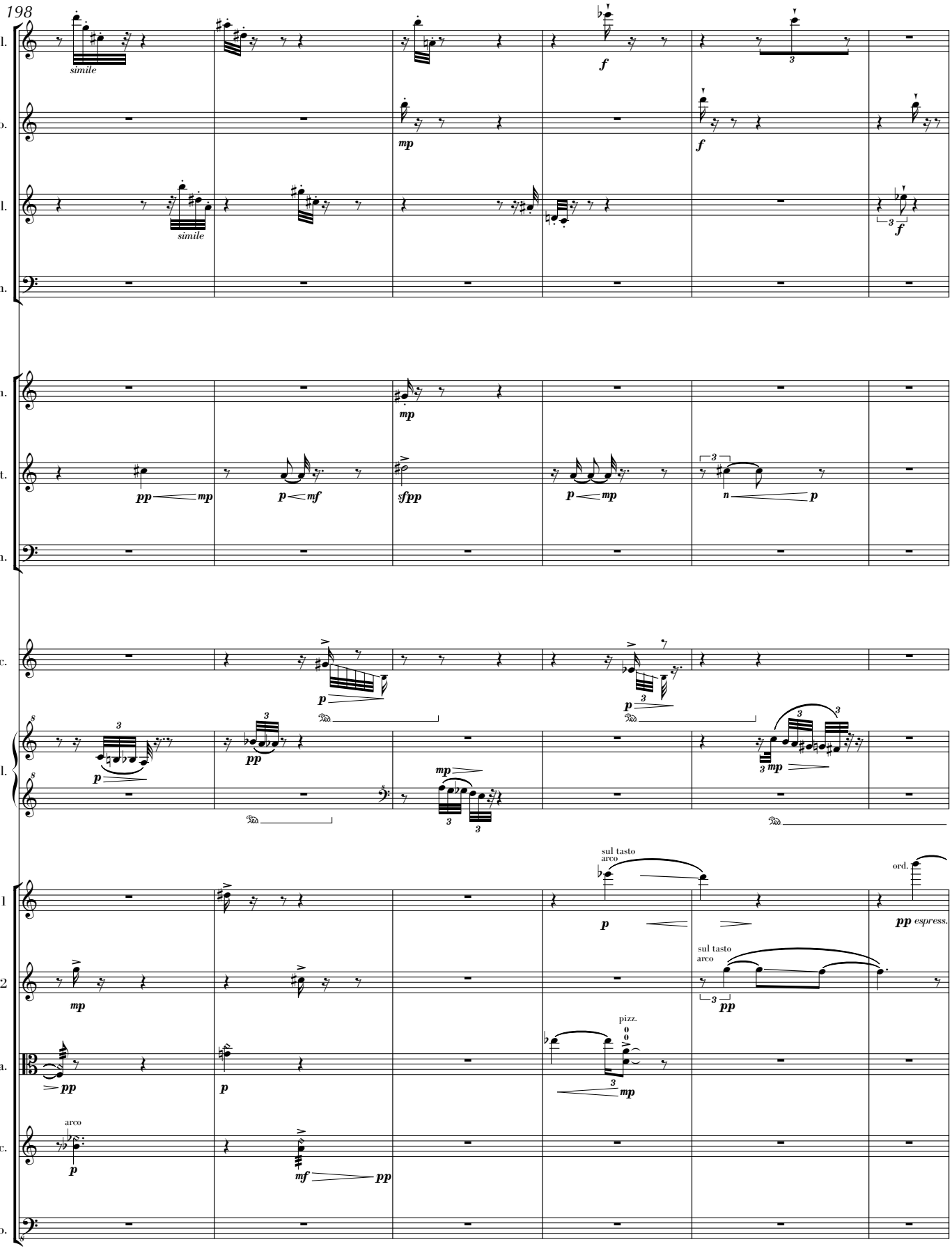

177
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
on the string
ricochet (unmeasured)
1/2 col legno battuto
on the string
1/2 col legno battuto

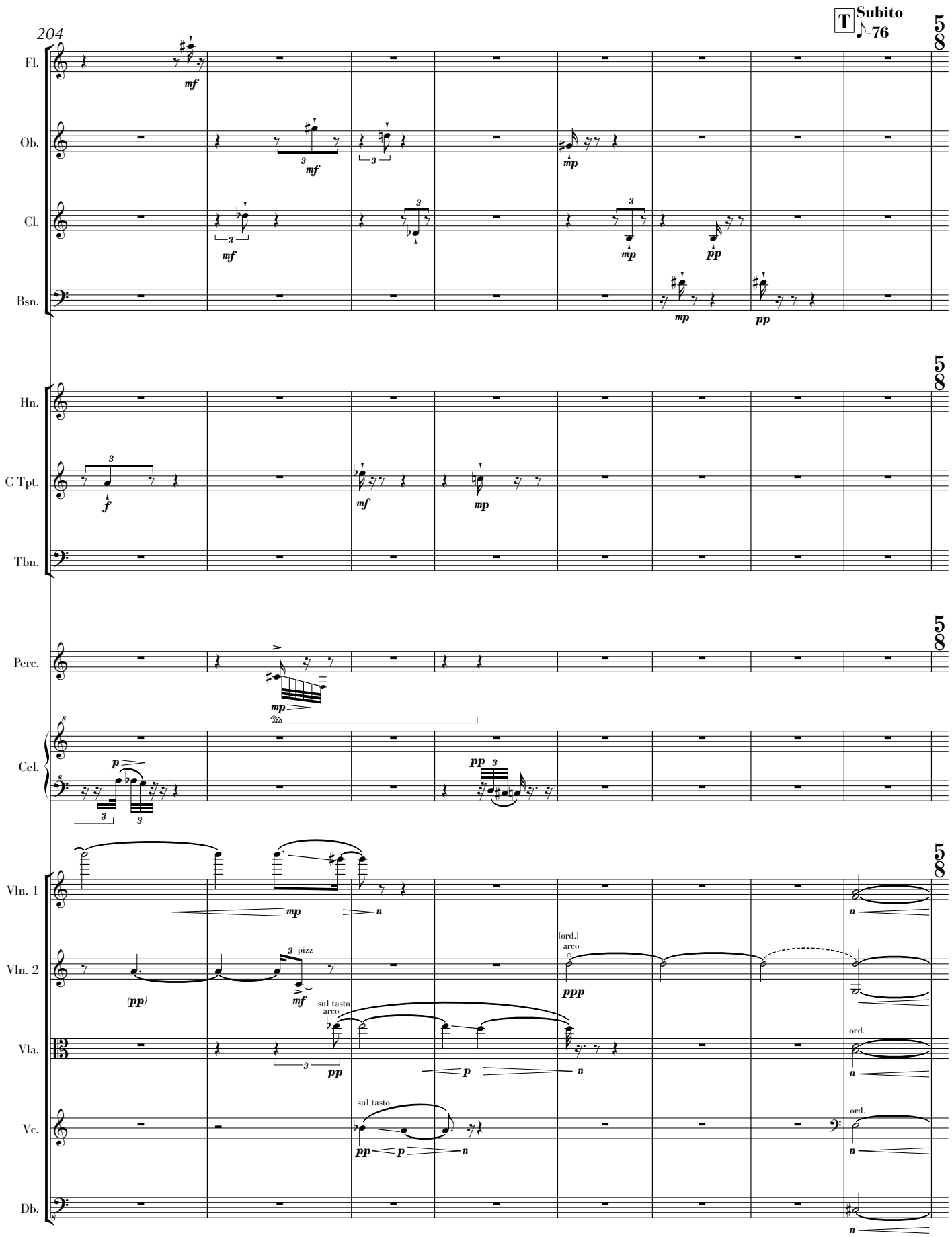

181
Q
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Timp.
snare sticks
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
arco
on the string
pizz.
gliss.
open

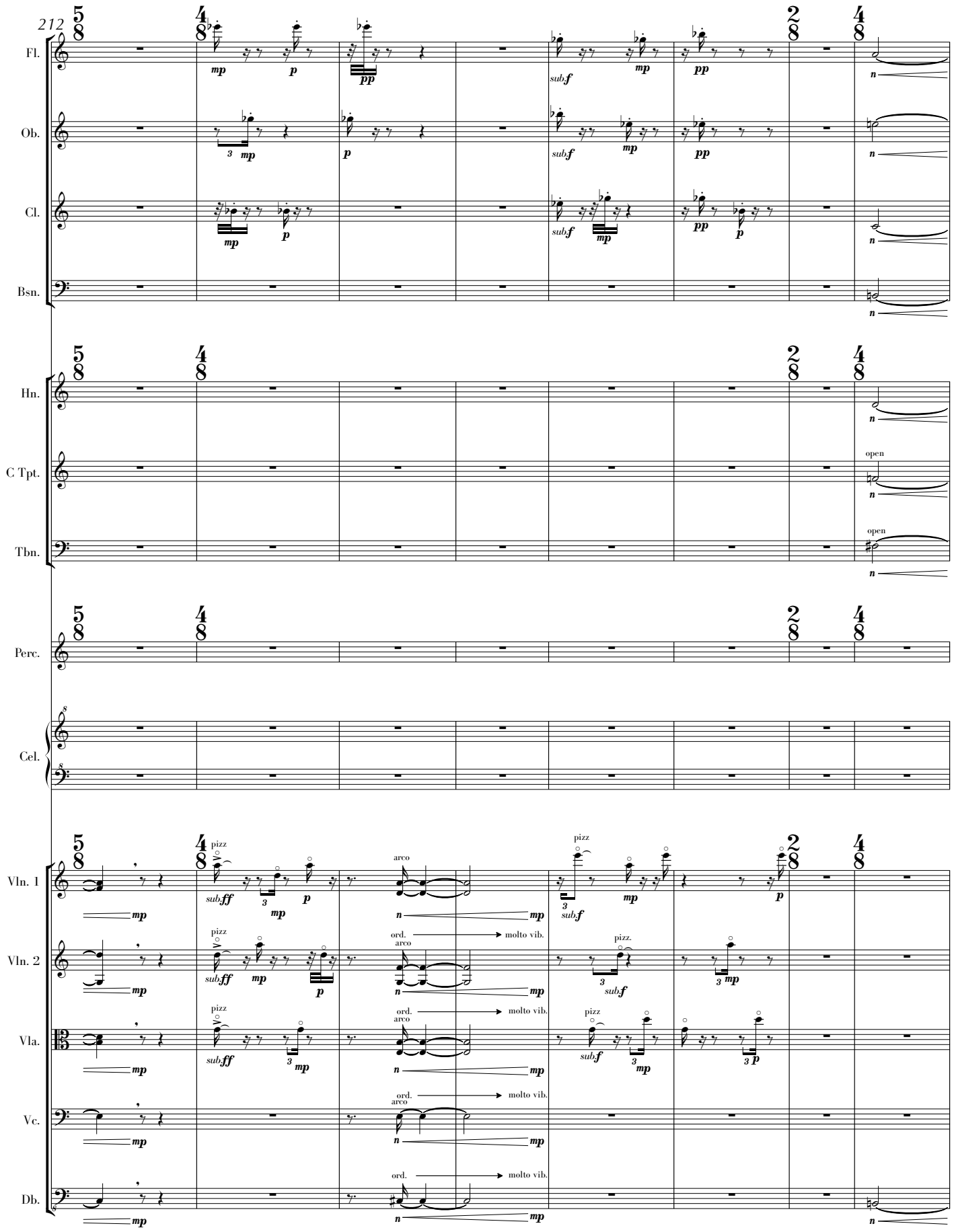

molto accel.
R
♪= 112 Leggiero (tempo I)
185
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Vib.
(hard mallets)
Timp.
Cymb.
(stick)
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
pizz.
arco
gliss.

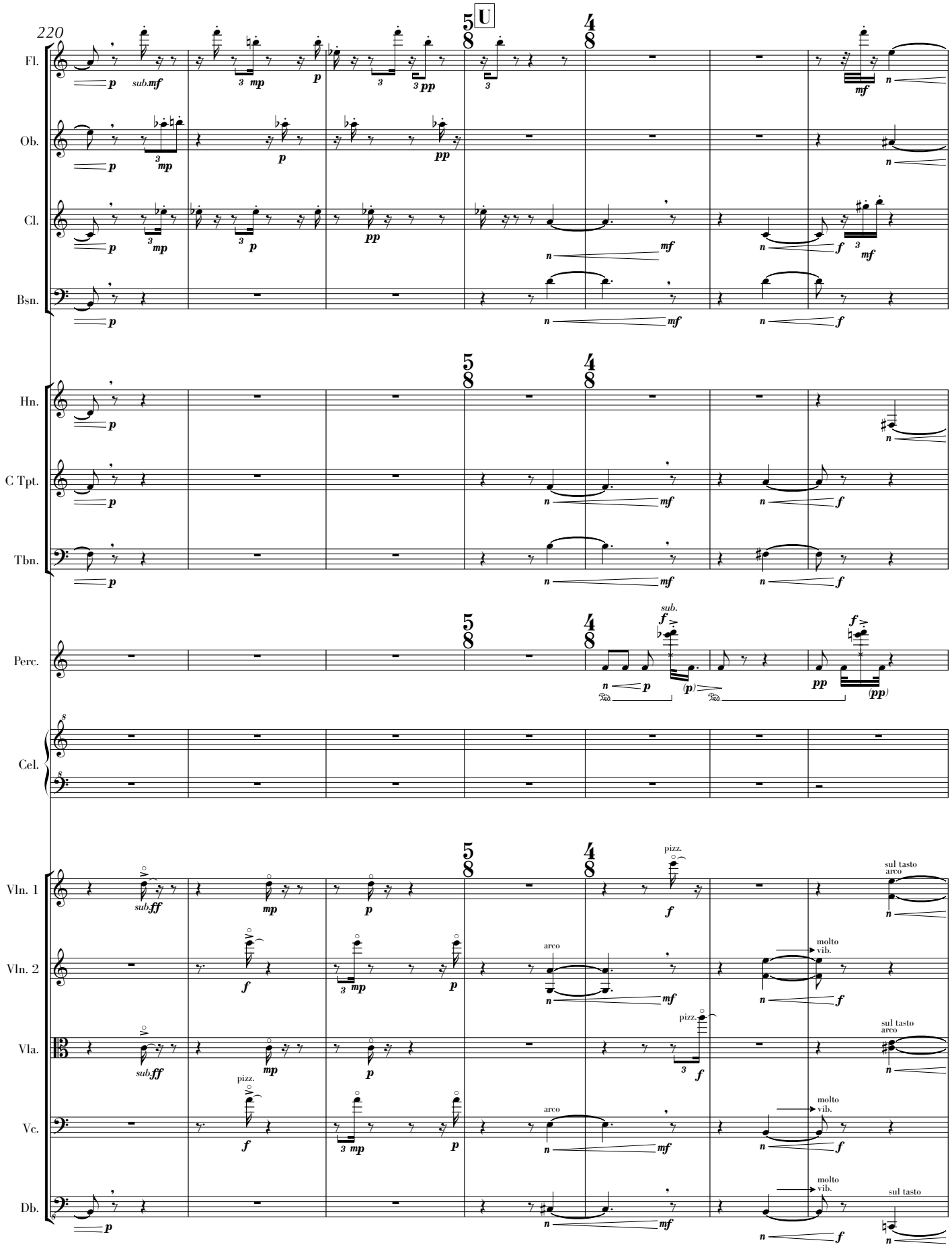

188
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
ord.
mp
sub.mf
pizz.
p
arco
f

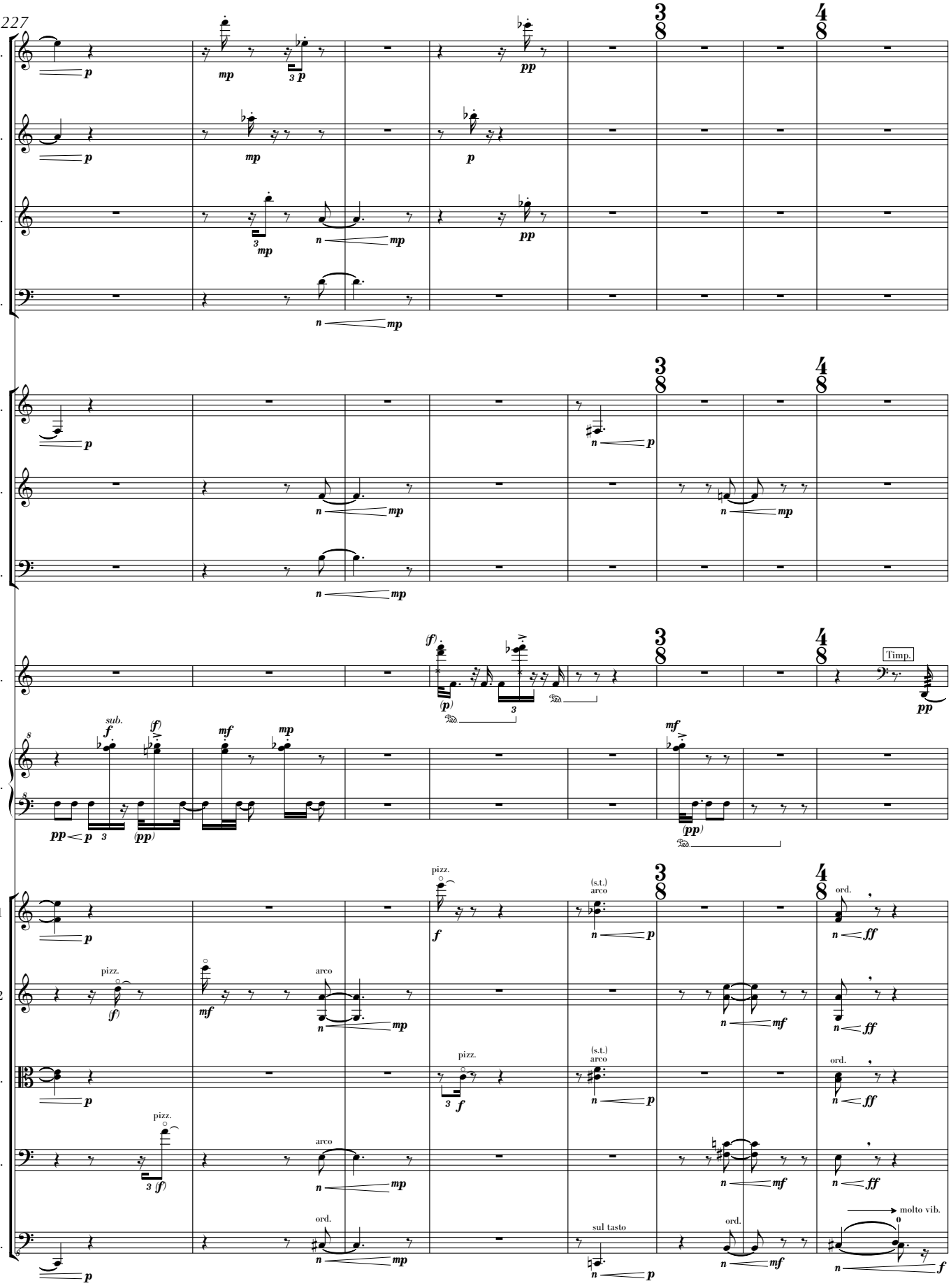

193
S
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
simile
sub.f
mp
mf
harmon mute
p
n
Vib.
(- same mallet)
(dry)
hard yarn
l.v.
drag left mallet across (white) keys for gliss.
pizz.
arco
IV
pp

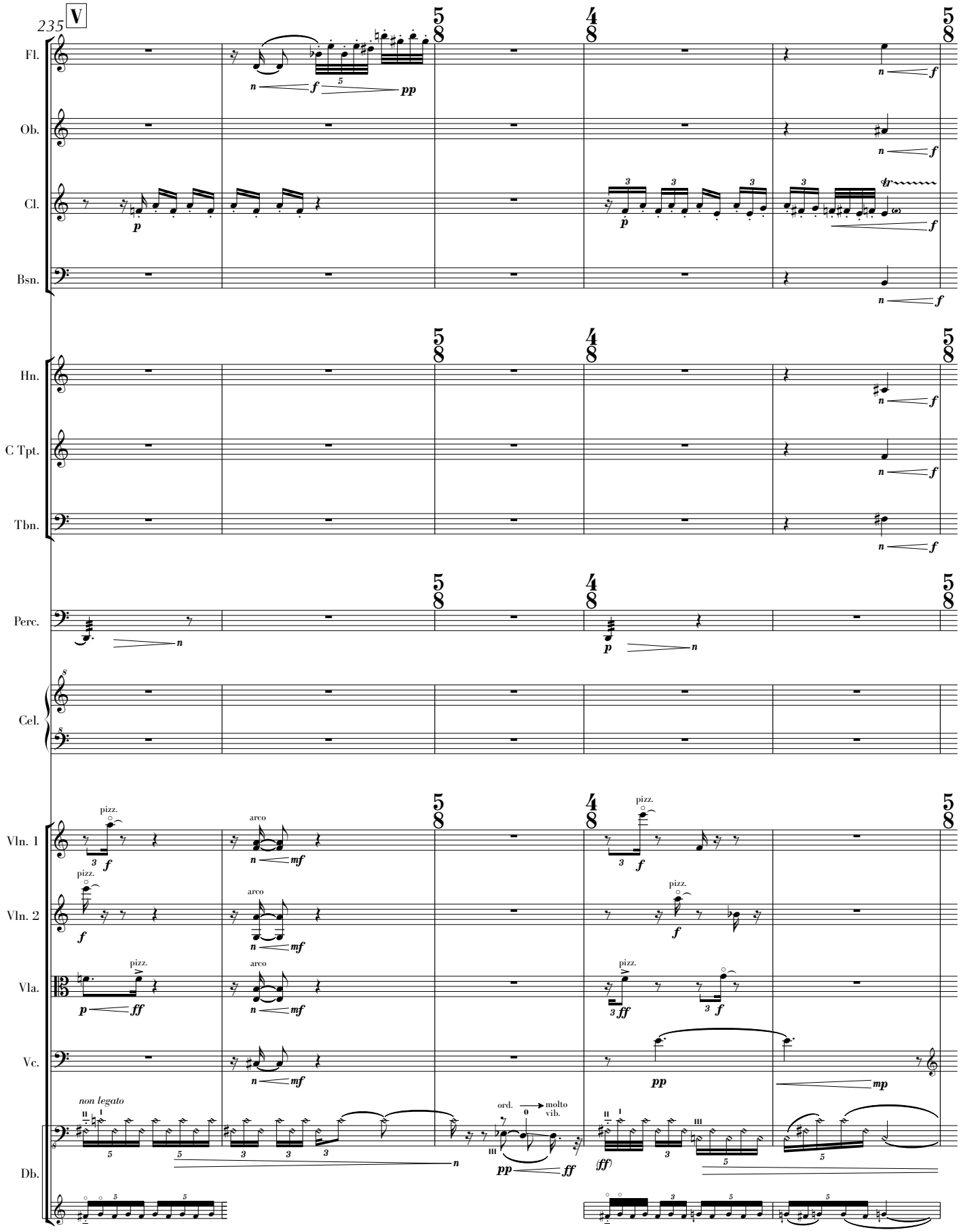

198
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
simile
sul tasto
arco
ord.
pizz.
espress.

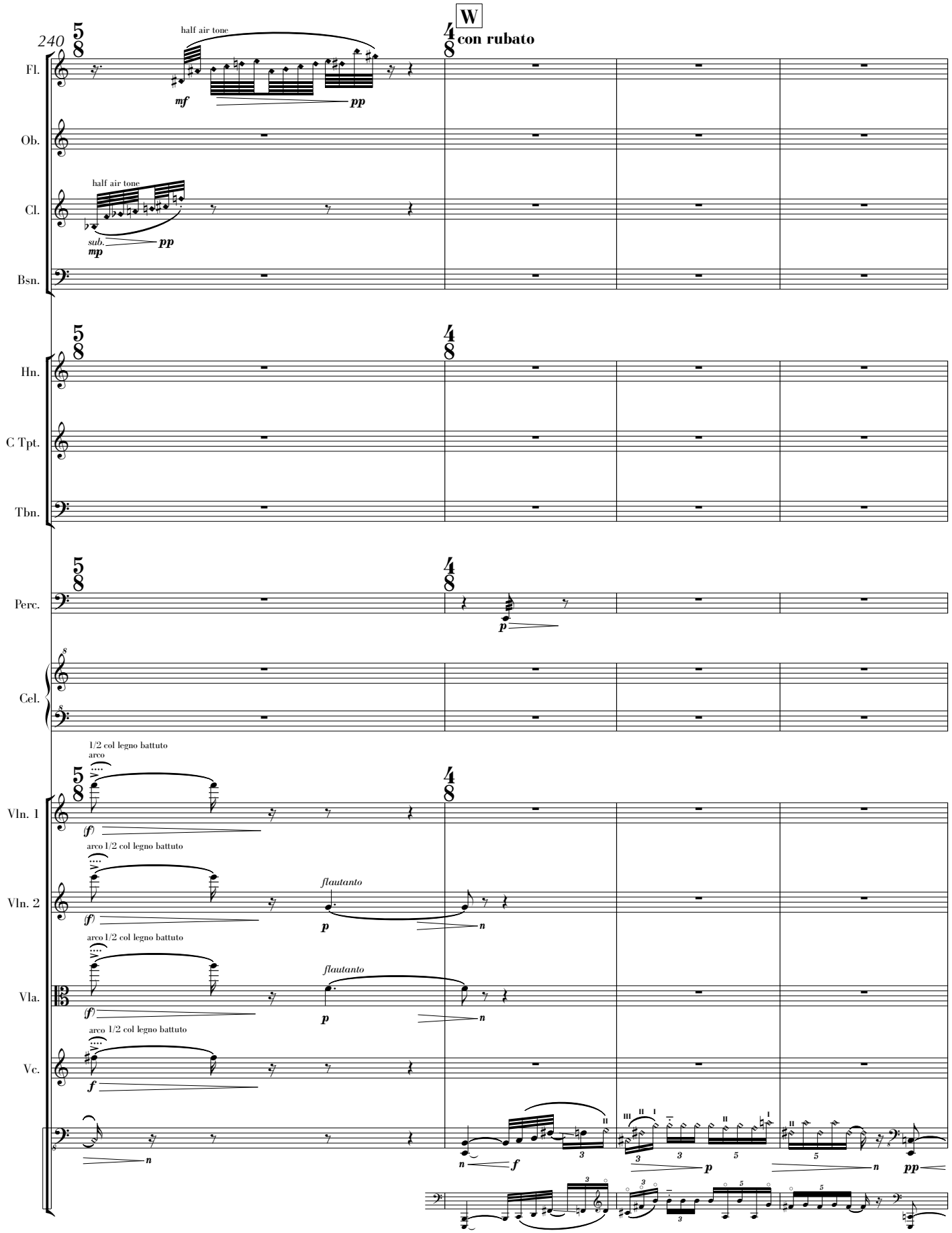

204
T Subito
♪=76
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
mf
mp
pp
f
p
(pp)
pizz
sul tasto
arco
(ord.)
ord.
ppp

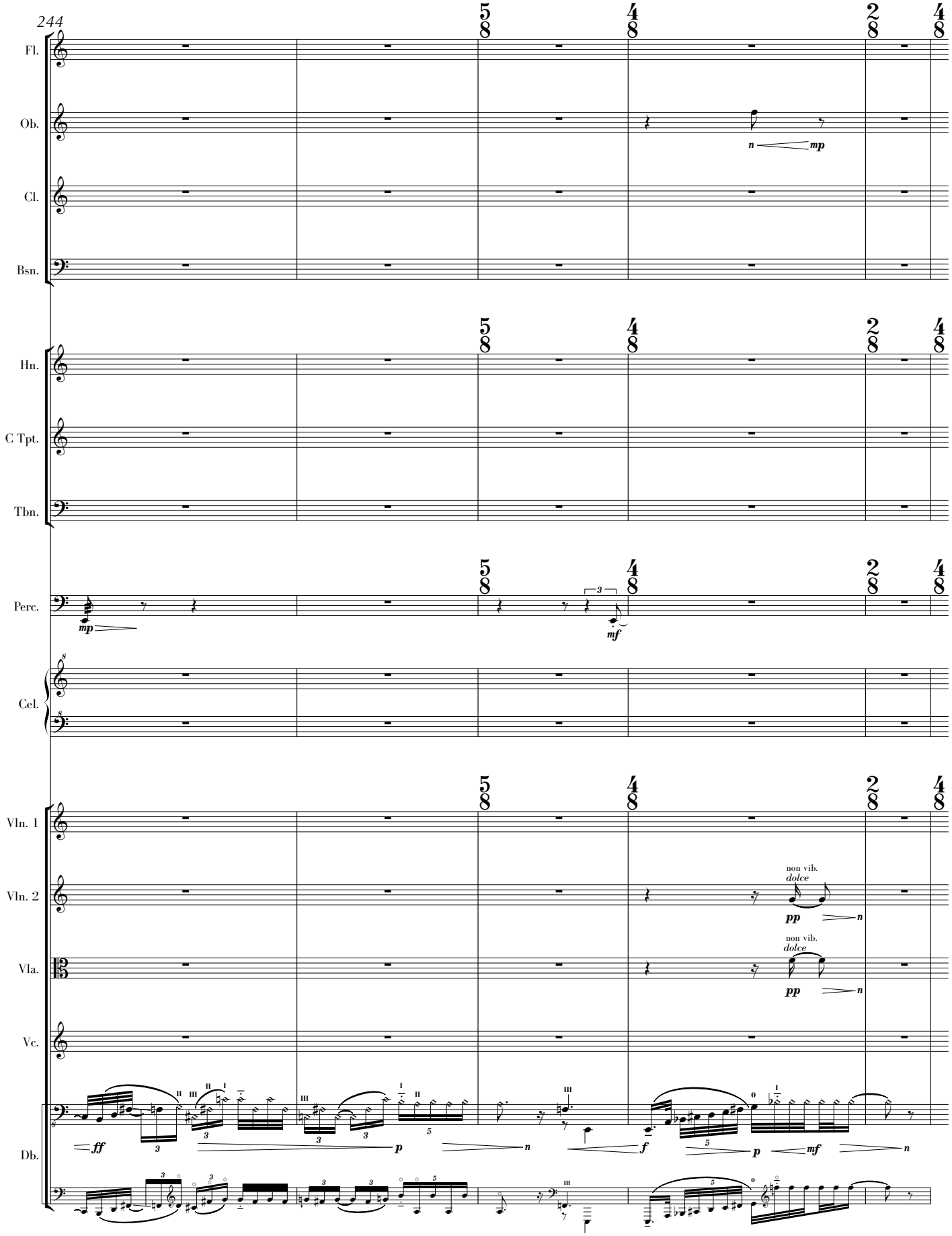

212
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
pizz
arco
ord.
molto vib.
open

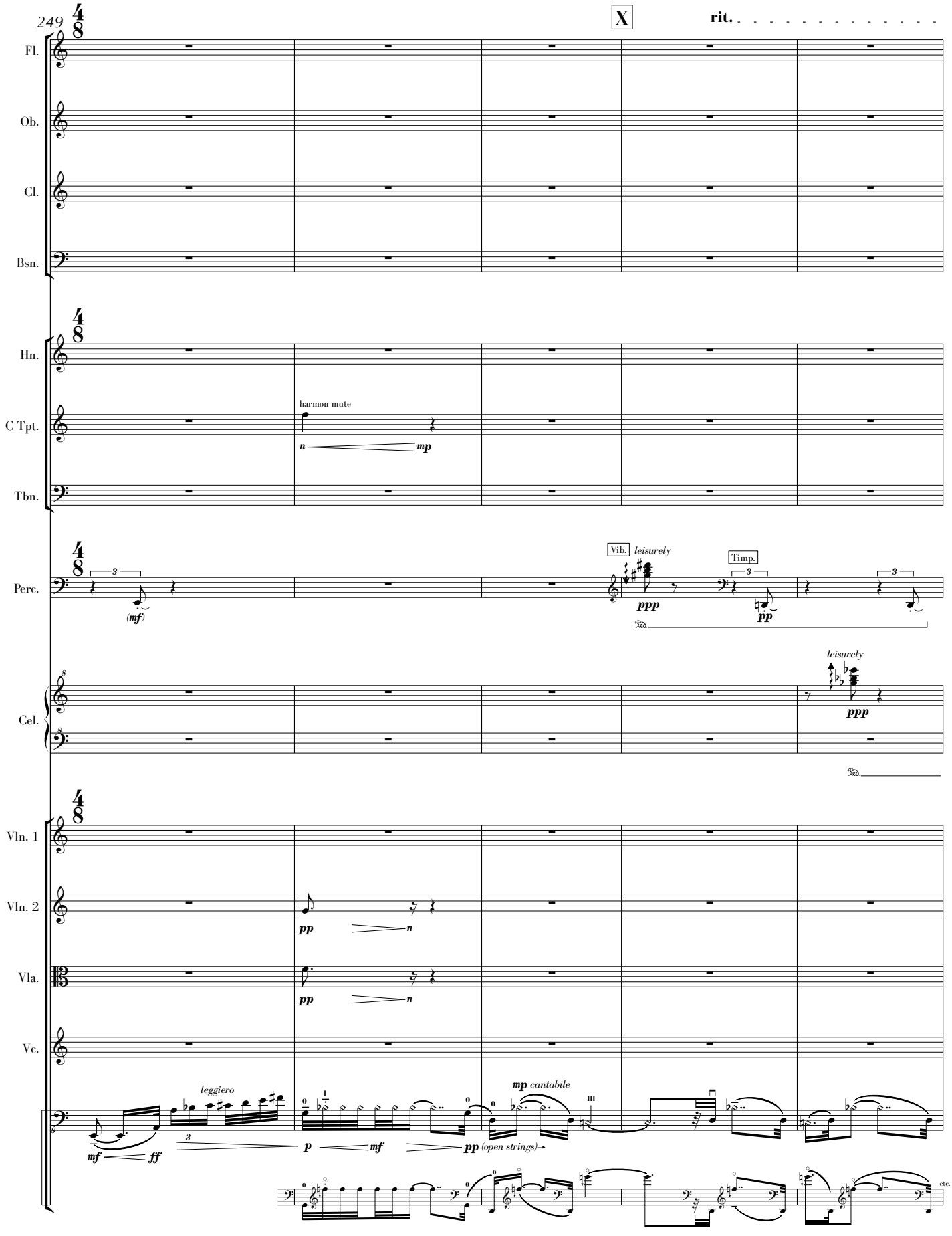

220
U
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
sub.mf
sub.ff
pizz.
arco
molto vib.
sul tasto
arco
sul tasto

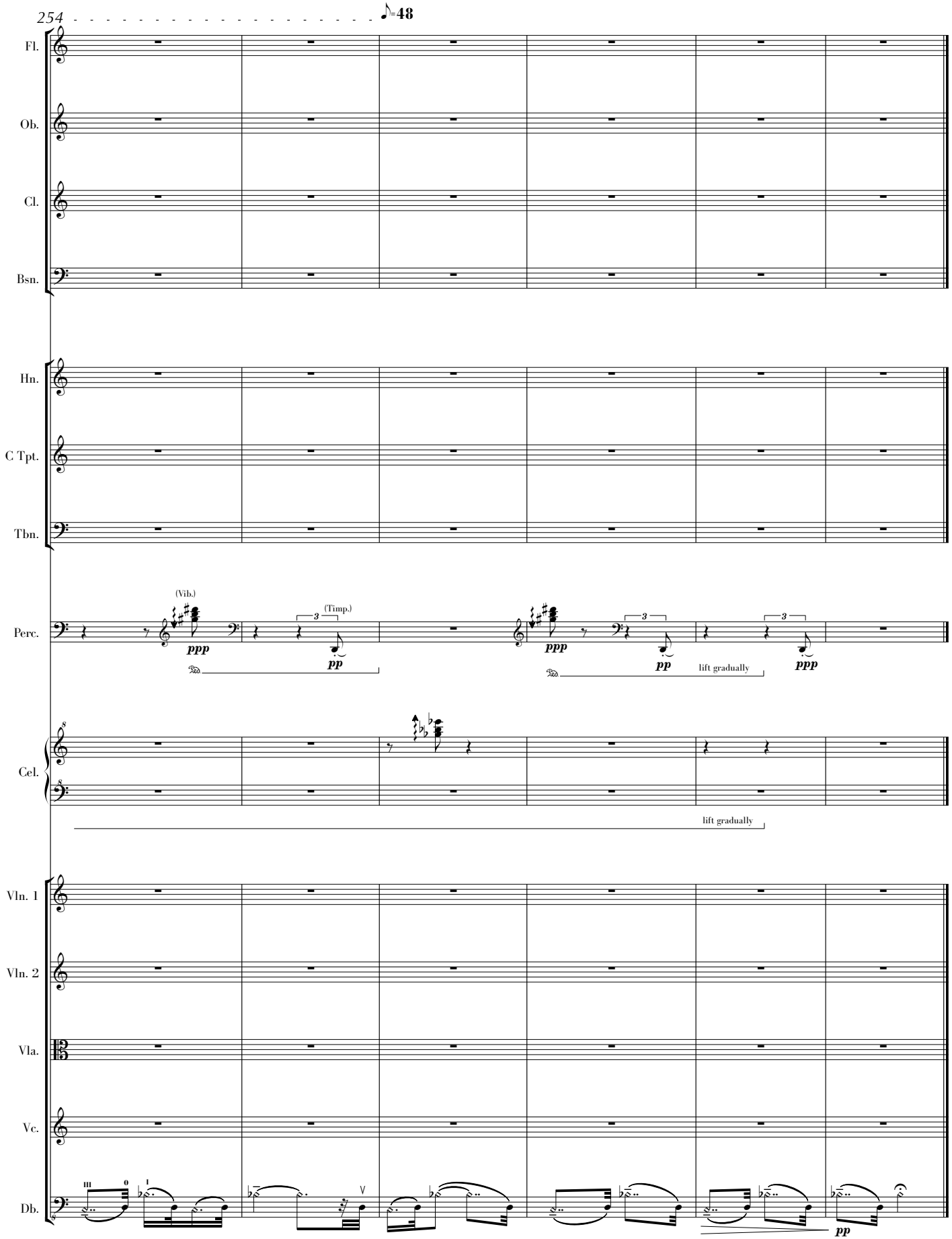

227
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Timp.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
pizz.
arco
(s.t.)
ord.
sul tasto
molto vib.


235
V
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
pizz.
arco
non legato
ord.
molto vib.


240
W
con rubato
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
half air tone
mf
pp
sub.
mp
1/2 col legno battuto
arco
(f)
flautanto
p
n
f


244
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
Cel.
Vln. 1
Vln. 2
Vla.
Vc.
Db.
5/8
4/8
2/8
4/8
n mp
mp
mf
non vib.
dolce
pp
ff
p
f
mf


249
X
rit.
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
harmon mute
n
mp
Tbn.
Perc.
(mf)
Vib.
leisurely
ppp
Timp.
pp
Cel.
leisurely
ppp
Vln. 1
Vln. 2
pp
n
Vla.
pp
n
Vc.
leggiero
mf
ff
p
mf
pp (open strings)
mp cantabile
etc.


254
♪=48
Fl.
Ob.
Cl.
Bsn.
Hn.
C Tpt.
Tbn.
Perc.
(Vib.)
ppp
(Timp.)
pp
ppp
pp
lift gradually
ppp
Cel.
lift gradually
Vln. 1
Vln. 2
Vla.
Vc.
Db.
pp

Breath, Contained II

for bubble wrap quintet and live electronics

Tonia Ko (2015)

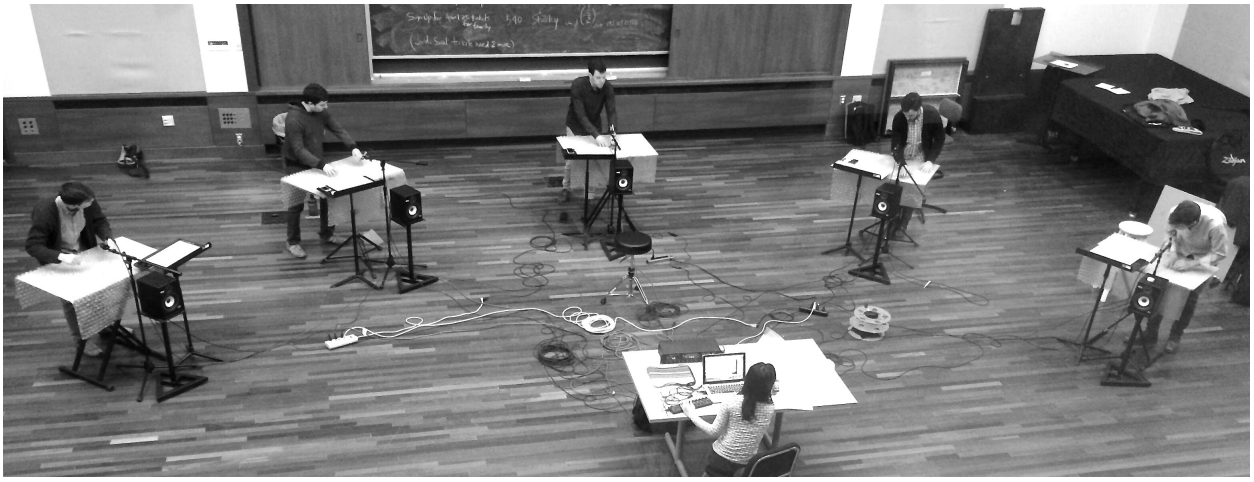
Equipment:

5 (wood or particle board) boards, 2'x 3'
5 X-stands on which to mount the boards
Large, medium, and small (from left to right) bubble wrap panels, 1' x 4', but can be longer
Bubble wrap should be affixed securely on each board (3M dual-lock fasteners work best)

5 pencil condenser microphones
5 small speakers
5 speaker stands, if available
5 personal devices with Touch OSC application
1 Audio interface (preferably with five xlr inputs and outputs)
1 USB foot pedal

Laptop to run Max/ MSP patch
All the cables

Setup Example:



Sandbox Percussion with Michael Compitello, Cornell University, March 2015

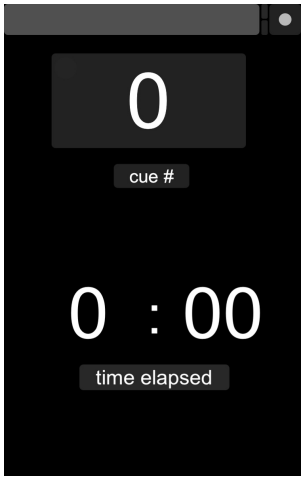
Performance Notes:

Please contact composer for Max/ MSP patch and Touch OSC app, "bubblephone"

Duration is approx. 13-15 minutes

All players perform from score

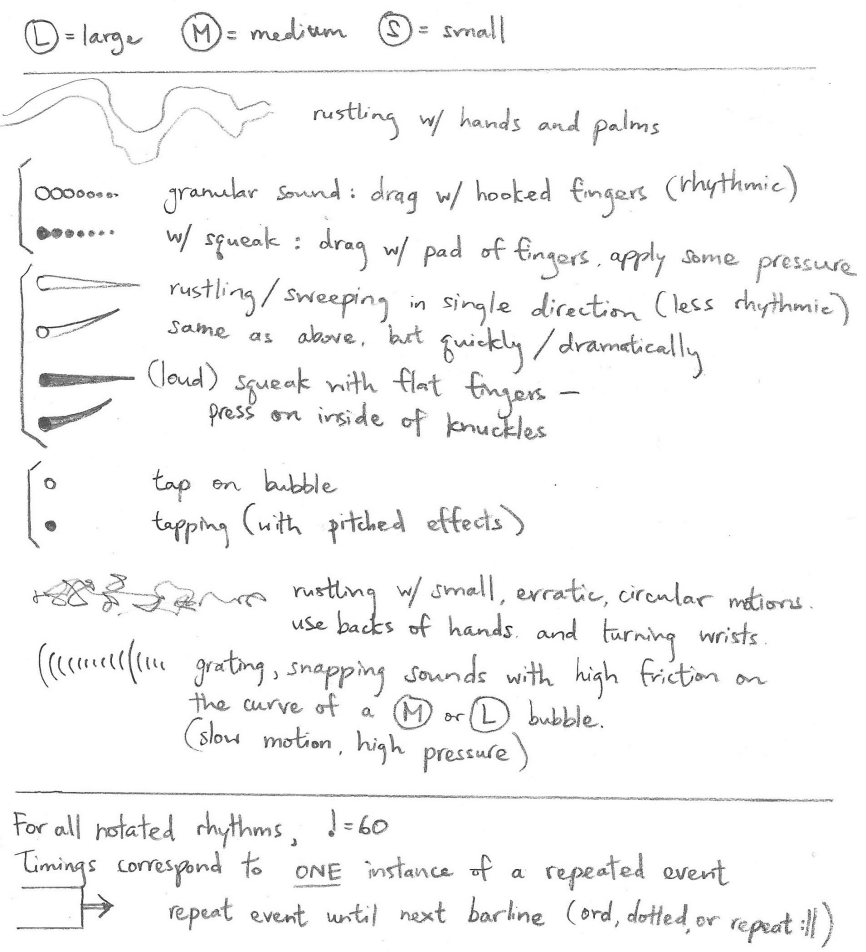
All timings are approximate. The priority is ensemble interaction and commitment to the character of each gesture.

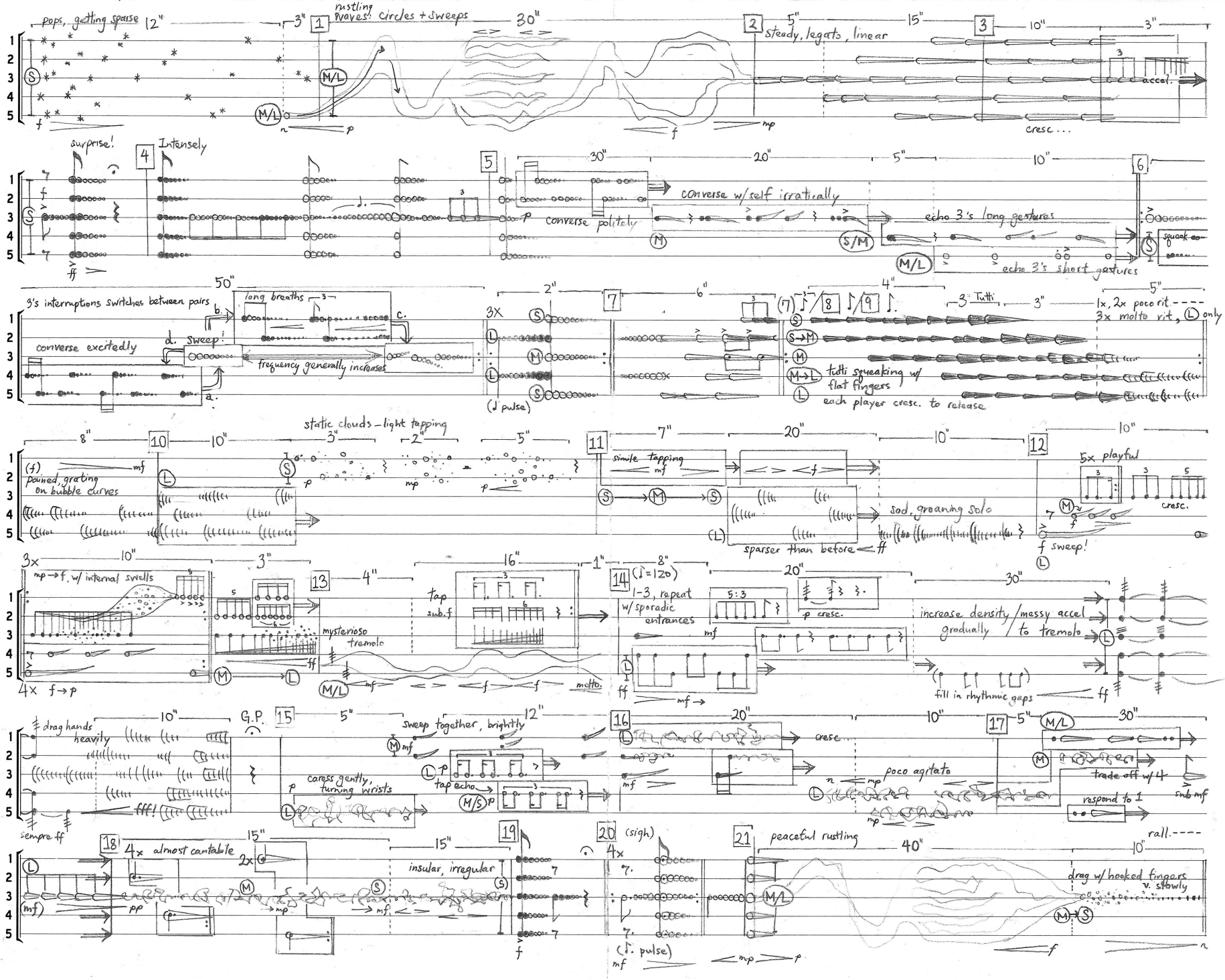


Player 3 (center) advances the electronics for the entire ensemble by USB foot pedal at each rehearsal marking

Every pedal action also advances the Touch OSC app (shown to left), displaying the cue number and time elapsed on each performer's device.

Key:




pops, getting sparse
rustling waves: circles + sweeps
steady, legato, linear
accel.
cresc...
surprise!
Intensely
converse politely
converse w/self irratically
echo 3's long gestures
echo 3's short gestures
squeak
3's interruptions switches between pairs
converse excitedly
long breaths
frequency generally increases
(♩ pulse)
Tutti
1x, 2x poco rit.
3x molto rit, (L) only
tutti squeaking w/ flat fingers
each player cresc. to release
static clouds – light tapping
(f) pained, grating on bubble curves
simile tapping
sad, groaning solo
sparser than before
5x playful
cresc.
f sweep!
mp → f, w/ internal swells
4x f → p
mysterioso tremolo
motto.
tap
sub.f
1-3, repeat w/ sporadic entrances
(♩=120)
5:3
p cresc.
increase density/messy accel gradually / to tremolo
fill in rhythmic gaps
drag hands heavily
sempre ff
G.P.
caress gently, turning wrists
sweep together, brightly
tap echo
cresc...
poco agitato
trade off w/ 4
respond to 1
sub mf
4x almost cantabile
2x
insular, irregular
(sigh)
4x
(♩. pulse)
peaceful rustling
drag w/ hooked fingers
v. slowly
rall.